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Selections on USSR Air Forces from 'AVIATSIYA I KOSMONAVTIKA,' Nos 4-6, 1980

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AIR FORCES: NEED FOR ALERTNESS IN FLIGHT STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1980 pp 8-9

[Article by Col Gen Avn A. Andreyev, honored military pilot of the USSR and candidate of military science: "Automatically, but Consciously"]

[Text] The fighter, piloted by expert military pilot Captain V. Voytenko, entered the flight zone exactly at the designated time. Having turned the aircraft along its boundary, the pilot began to search for the target. An independent aerial battle against an experienced "enemy" faced him. Soon, Voytenko noted the silver machine of Capt A. Tsyganock whom the command point was guiding on a collision course. The aerial fighters detected each other almost simultaneously. The battle started under equal conditions.

Tsyganok, a firstclass pilot, was not in any way inferior to Voytenko. He flew at maximum speeds with maximum G tolerances. Nevertheless, expert experience made itself known: Voytenko succeeded in occupying a favorable firing position by means of a successful maneuver. It only remained to take aim and conclude the attack with a triumphal volley. The pilot, without looking, reached for the switch with his hand and turned it on ... not that it was necessary. The attack on the target had been disrupted.

Here, the question is justified: Why did a pilot who had repeatedly performed similar assignments, put his foot in it? They took an interest in his preparations on the ground. He had done all that was necessary. He had modelled the assignment in his work book in various versions, he had gamed it using the "dismounted-flying" method, he had trained on the trainer, and immediately before the take-off he had sat in the cockpit and once again thought about the flight. Thus, it was not possible to reproach the captain for insufficient preparation. When they examined the error committed by the experienced aerial fighting man in the squadron, one curious feature was detected. The pilot had carried out the individual operations mechanically, without thinking. He flew in a masterly fashion, he had firm and fine skills in operating with the cockpit instruments. And here, this automatism--strange as it may seem -- had let the pilot down. The senior commanders came to this conclusion.

In the "man-machine" system, the role and importance of automatic habits can scarcely be exaggerated. Most likely I would not be mistaken if I said that the entire methodical side in the training of highly rated aerial fighting men simply boils down to developing in them -- in a very short period -- a certain automatism in controlling equipment and weapons. This provides a pilot with the opportunity to free his attention during modern combat from that which is secondary and concentrate it completely on carrying out the solution which has been found to achieve victory. Therefore, can one consider that which happened to Captain Voytenko during the flight an accident? To some degree, it is so. It is even possible to say further: The aviator did not commit a similar negligence neither before nor afterwards. However, an interesting conformity to law is concealed behind this accident.

The development of automatic habits takes place according to a well-known scheme which has proven itself. The pilot first studies theory, then practices flight elements on a combined trainer system, and in conclusion reinforces the habits, which have been acquired, directly during flight. The effectiveness of this method has been verified by life and by training practices; however, disappointing failures also occur among both young and experienced aerial fighting men. How can these be avoided? They tried to answer this question in the regiment where Captain Voytenko serves.

They discussed the individual peculiarities of each pilot at a meeting of the leading element and in the instructional methods council. They ascertained what principles and methods helped them to acquire more rapidly the necessary skills in working with the cockpit equipment. Next, they outlined a training program considering the personality qualities of the aviators, especially the young ones who were starting to master an aircraft that was new to them. In doing this, special attention was paid to the fact that a pilot -- in perfecting a certain operation -- must control himself according to the principle: Turn the switch on -- look what it is; perform any operation -- check whether it has been done correctly. Every action of a pilot must be thought out, conscious, and logical.

Various trainers, stands and training aids exist in the unit in order to develop firm habits. With their help, a pilot on his own or on the advice of an instructor can train on individual elements, for example, when landing, intercepting a target, along the route, etc. The unit's rationalizers and craftsmen have displayed a great deal of ingenuity and inventiveness in the creation of these training aids. Thus, Engr-Sr Lt L. Aleksandrov, Sr Lt Tech Serv Kh. Mukaramov and Engr-Maj A. Grigor'yev developed a training stand called "Cockpit Equipment and the Operation of an Airplane's Systems." The stand is well thought of because the turning on of any switch in a plane's cockpit, the movement of control levers, and other pilot actions are visually illustrated on the diagram. The pilot sees the process taking place in this or that system and thereby not only learns the movement by heart but also visually memorizes the distinctive features in the operation of the aircraft's mechanisms and assemblies and the order and sequence of their interaction. Practice has shown that the effectiveness of the training stand in increasing the knowledge of pilots and their confidence in the equipment's reliability is evident -- aerial fighting men perform flight missions better.

They are travelling along the same path in the Chernigovskoye Higher Military Aviation School for Pilots. Instead of increasing the quantity of expensive trainers, the inovators and rationalizers created very varied training stands on which students practice individual operations and acquire skills in working with the cockpit equipment when lowering the undercarriage and performing flight maneuvers. It is necessary to emphasize that the majority of the diagrams and stands are paired with a plane's cockpit and a stopwatch. This is especially important when developing some skill or other. Clarity of training is achieved, and all decisions made are evaluated by the director of classes both in a quantitative and a qualitative respect. In other words, time is the basic criteria for developing professional skill here.

Classes take place year round at any time. This is very important because it is necessary to improve skills systematically, at an ever growing tempo. It is no accident that the number of aborted flights has been significantly reduced with the shift to this sytem, and that pilots and students have begun to make fewer mistakes in flying and combat employment techniques. The organizational diagram itself of the trainers has been simplified. After a narration or lecture in a classroom, the students go to the trainers and each one practices that which he considers necessary. Only then do they go to combined trainers which provide the opportunity to receive skills in working with the aircraft systems or individual assemblies in the time deficit mode and in a complicated flight situation. For example, an aircraft-trainer permits practicing start-ups, testing an engine on the ground, and the actions of a pilot during special flight situations linked with power plant failures in the air. On the navigation trainer, skills in reading the navigation flight instruments are worked on, and aviators learn to correct errors in following a course during flights along a route and when descending for a landing. The firing trainer provides an opportunity to perform different exercises connected with the aiming systems and weapons.

In general, the training base plays an important role in the training of aerial fighting men. Very serious attention has been paid in the school to its improvement. It was created by the efforts of the instructors and specialists in the laboratories of the appropriate departments. The knowledge and skills acquired by the students with the help of the trainers permits them to act confidently during a flight and to react rapidly in a complicated situation.

Thus, once student V. Slyusarenko got into a complicated situation in the air. Thanks to the fact that he had been well trained on the ground, he acted accurately and intelligently and completed the flight satisfactorily.

Another example. Last year, the students frequently made mistakes in reading the course both on the trainer and in the air. Then, additional training sessions were conducted on a special trainer. The result -- these mistakes became a rarity.

The benefit from the educational trainer sets is undoubted. Their effectiveness is greater, the better they recreate an actual flight situation, the better they permit practically any flight mission to be carried out on the ground, and the better they teach one to act intelligently in special situations.

Meanwhile, there are pilots who consider it beneath their dignity to fly on a trainer. Once, Capt V. Otryshko made a mistake when descending for a landing. During the critique it was ascertained that he had not worked on a trainer on the eve of the flight. Moreover, he declared: "What does this trainer give? The fact that I landed ahead of time -- it was an accident."

Unfortunately, some other aviators also regard trainers with preconceived ideas. At times, the time allotted for working on them is simply served considering that there is little benefit since the instruments are not located as they are in an airplane cockpit.

But if one looks a little more carefully? During an ordinary flight a pilot performs a mass of operations within a six-minute period. Not all the actions during this time are conscious ones; the majority of them are intuitive, developed by long training sessions on the ground and in the air. However, even well mastered skills can be lost. Every pilot knows, for example, his physical and psychological sensations when he takes a seat in an airplane after a leave -- he is not successful in keeping an eye on everything, he doesn't have enough attention. He receives one trainer flight, another .... and after the flights on the trainer, the pilot as a rule acts correctly, almost without mistakes, in the two-seater. All this is a matter of skill.

The introduction of complex trainer systems into the training process is a command of the times. Two avenues have been charted in the creation of these systems: the revision and unification of technical system complexes by specially developed mechanisms which permit the necessary information to be inputted and the creation of new complexes based on universal electronic computers.

The introduction of computer equipment into the training process is becoming an objective conformity to law and is contributing to raising the effectiveness and quality of the pilots' training. Here, it is very important that they busy themselves with the improvement of the training base not only on the spot but also in design and construction organizations. You see, a trainer created by industry lags behin the assemblies made directly at the airfield by army craftsmen. Yes, these organizations must also regard more attentively that which is being done in regiments and schools.

In cooperation with science and the capabilities of progressive industrial production, our rationalizers are capable of improving the present training base. In the interests of flight safety, a trainer for conducting combined practical classes for an aviation regiment's flight controller group was made in the Voroshilovgradskoye Higher Military Aviation School for Navigators imeni Proletariat of the Donbas based on a trainer designed for training Civil Air Fleet controllers. Training sessions are conducted on the trainer according to a specific planning table for the flying day and includes the practicing of actions in controlling crews on the ground and in the air under any unforeseen circumstances. Such a trainer is needed at every airfield. However, since it is made from available materials it is rather cumbersome. This is delaying its introduction into line units.

But why haven't the scientific organizations and design bureaus taken an interest in a useful innovation? In the school, there are specialists who are already now proposing to introduce changes into the computer and improve the lay-out of the individual units. However, for some reason their proposals are not being listened to. As a result, training items which lag behind the requirements of the times sometimes arrive in a unit.

The fact that ever more varied equipment is appearing in units and subunits, is good. There is the opportunity for each one to select for itself the type of trainer that is needed and to develop those skills which will be needed during a flight.

However, let us return to the beginning of the discussion. By systematically training on trainers, a pilot becomes so accustomed to the instruments that he is not in a condition to interpret any phenomenon in the air without their readings. In a real combat situation, a situation can be created where neither the radio technical equipment which is supporting the flights, nor the on-board sights or other instruments work, and it will be necessary to make a dead reckoning in one's head, calculate lead angles when attacking the target, and find the airfield using a knowledge of the starry sky.

Here, it seems to me, it is very important to develop creative thinking by pilots, resourcefulness, and initiative and teach them the usual, forgotten "grandfather" method to search for targets and wage battle along with the development of new skills.

They have learned this in the regiment which we have mentioned. When preparing for flights, definite time is allotted here to the solution of different tasks in one's head and to experiences in tests which have been well compiled by the best prepared instructional methodologists. A great deal of attention is devoted to the drawing up of various mission models. These classes are especially practiced before exercises and flights on combat employment. All this helps to develop in pilots initiative, creativity and the ability to solve complicated combat training tasks when time is short.

In order to control a modern aircraft and to be able to employ it effectively during combat, a pilot needs highly automatic and solid skills in working with all the cockpit equipment. At the same time, these skills must be thoroughly conscious ones and controlled. As experience shows, it is possible to achieve these skills using mental modelling and the announcement of the sequence of actions in an actual flight made together with training sessions on technical system complexes. As a method, an imaginary flight conceals in itself enormous possibilities. However, for this it is necessary to study persistently and purposefully, train one's memory, increase one's knowledge, develop ability, and strengthen skills.

The continuous improvement of the training material base and the methods for training aerial fighting men is a reliable guarantee for the further growth of subunit and unit combat readiness.

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AIR FORCES: HELICOPTER TACTICAL FLIGHT EXERCISE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1980 pp 10-11

[Article by Lt Col B. Budnikov, military pilot firstclass: "Maneuver and Shock"]

[Text] The aviators had prepared for this tactical flight exercise ahead of time. In accordance with the command element's plan, the helicopter crews had to carry out the movement of men and equipment to the designated areas, land the assault forces at the prescribed points with a landing on unfamiliar sites, and inflict strikes on ground targets overcoming strong "enemy" air defenses. The flying, tactical and firing training of the experienced and young aviators was checked within the scope of the combat training program.

It is necessary to say that the crews had already solved similar tasks during day-to-day military training. However, that which had to be done during the exercise was new even for veteran pilots. Apparently this is as it should be since exercises-- no matter at what scale they are conducted -- are a test of the combat maturity of their participants and a strict check of the crews' coordination in flying together and their professional and moral psychological preparation. For this, a definite tactical background is created during an exercise, the men normally receive assignments unexpectedly, the preparation time is limited to the minimum necessary, and the crews solve the task in the air according to an independently selected plan which has been approved of course by the commander. Difficulties are presented to the crews and the exercise situation is approximated to an actual combat one.

In accordance with the tradition which has taken shape, before the exercise the better trained aerial fighting men shared their experiences in participating in different exercises with the young aviators in the subunits, they directed their attention to the peculiarities in carrying out the assignments, and narrated how at times a seemingly simple thing turned into complications for crews with little experience and they coped with them with difficulty. Therefore, it is necessary to prepare thoroughly for every flight no matter how simple it is and to take into consideration the most insignificant at first glance details.

A discussion also took place during party and Komsomol meetings on the responsibility of each fighting man for his own preparation and the preparation of the aviation equipment for the exercise in order to solve the assigned tasks with high quality.

Special attention during the advance and preliminary preparations was devoted to the solution of various tactical inputs and the modelling of assignments according to various plans depending on changes in the situation. The measures which were conducted showed that the flying staff had been well prepared for the exercises.

As usual, the tactical flight exercise began with an assembly of the personnel. The flight crews arrived in good time at the airfield and reported on their readiness for action.

Data from the aerial scouts soon arrived at the command point. The task of inflicting a strike on a concentration of "enemy" troops and equipment located in an almost inaccessible place was assigned to Maj G. Belov, the squadron commander. Having familiarized himself with the aerial photos, Ivanov assembled the leading element and flight commanders for a meeting which was conducted right by the helicopters. From a tactical viewpoint, the assignment was a very complex one. The fact of the matter was that high cliffs reliably protected the "enemy's" dispositions from the north and an approach from this side was ruled out. A narrow depression rose up on the opposite side to steep mountains. To the east, it turned into a ravine and to the west -- into a wide valley. On these sides, air defense systems provided dense cover for the troops. Thus, a daring tactical run was needed to solve this puzzle.

Having listened to the opinions and suggestions of the officers and having weighed all arguments, the commander made his decision ....

A scout helicopter, piloted by military pilot first class Capt V. Khachik'yants, rose from the airfield at the designated time. He had to pass over the valley near the "enemy's" dispositions outside the range of its antiaircraft artillery, attract attention to himself, and transmit his observations to the crews of the other groups.

During the days of ground training, the deputy squadron commander for political affairs had devoted a lot of attention to instilling high moral-political qualities in the personnel since an aerial fighting man needs them just as much as he needs a knowledge of the equipment, a knowledge of how to employ a helicopter in combat and the ability to think in a tactically erudite manner. Therefore, Captain Khachik'yants always tried during classes to cite examples of courage, determination, quickness of wit, and military cunning by front-line pilots in the different aviation branches. He also generously shared with subordinates his knowledge of tactics, and by his personal example showed that creativity and a constant search for new methods and ways to use the machines in combat are necessary conditions for increasing the effectiveness of helicopter operations.

Knowing the good tactical training of the captain, the command element also entrusted a critical task to him. Having carried it out, he was able -- in conformity with the situation -- to then provide fire support to his comrades.

Running ahead, let us point out that Captain Khachik'yants crew distinguished themselves again during the next flight. A situation had taken shape which required an urgent landing on a site limited in size.

The political worker asked the commander: "Permit me."

The officers understood each other perfectly well. The complicated assignment was carried out accurately and on time. Coordination in flying together, discretion, and accurate cooperation came to the aid of the crew members, and presence of mind and courage helped Captain Khachik'yants.

However, let us return to the flight which we were discussing above.

After several minutes, the strike group which was headed by Maj V. Panferov, the deputy squadron commander and a military pilot first class, started. The helicopters assumed the prescribed intervals and distances in the combat formation and set out on the course. There was silence in the ether. All the crews worked only on the receiver. The success of the assignment depends a lot on the leader, on how accurately he maintains the calculated flight regime. The path is a long one and very complicated. The route has many breaks over very rugged terrain.

But soon Capt V. Kunchikaliyev's pair left the route. A critical part of the assignment had been entrusted to them -- to travel along the path of the scout and, having spotted the "enemy", simulate an attack approach and draw the "enemy's" attention to themselves. Kunchikaliyev had carried out various assignments, but this was a first for him. He understood perfectly well that the success of the strike depended on the accuracy of the diversionary pair's actions and on their coordination. That is why he maintained the regime scrupulously. According to the commander's plan, the strike group had to hit the target from the opposite side at the time of their attack.

The scout's report that the "enemy" was uneasy was heard in the headphones -- movement had been noticed near the air defense mounts. "It is good. It means they are waiting," the captain thought and gave the order to the leader to fly lower -- a "front line" flight. The enormous bulk of the mountains rises up on the left and right. Flying in mountains is not a simple matter. It is not without reason that the training for flights under such conditions occupies one of the leading places in the flight training program of the pilots.

After several minutes the ravine began to widen noticeably. The panorama of a wide valley was revealed to the front. Another minute and the mountain on the left was left behind. Attention was concentrated to the limit. The brief command: "Prepare," flies into the ether. As had been conceived on the ground, the helicopter crews began a turn to the right, at the same time observing the "enemy's" actions. There is no doubt -- they have noticed them. Here is the exciting, the critical moment:

"This is 610, we are attacking!"

The pair took a battle course with a sharp left turn. Now, the fire of the "enemy's" air defense systems had to be concentrated on these helicopters. Would the deputy squadron commander manage to lead the strike group? At that moment, as if dispelling the doubts of the diversionary group's commander, Major Panferov's report sounded in the ether.

"This is 602, we are attacking!"

The strike group, having gone around the mountain, moved into the "enemy's" dispositions from the east and inflicted a powerful missile strike on the air defense systems and the accumulation of equipment. As soon as the first flight moved from the attack, the second headed by Capt A. Mingalev swooped down on the target. The firing points were in the sights. It was necessary to suppress them while the "enemy" was disorganized. The missiles flew at them like fiery arrows. Seconds passed and on the ground the enormous caps of the explosions sprang up.

A brief command in the ether.

"Exit to the left!"

At this time, the first flight carried out a maneuver to approach for a second attack.

The crews had successfully solved the assigned task. The material from the objective control systems confirmed their high firing skill.

The tactical flight exercise which had been conducted showed that the work which had been expended by the personnel on training had not been wasted. The flying staff had received good experience in working together in groups and with subunits of the Ground Forces and also in inflicting strikes on ground targets on an unfamiliar range under conditions of heavy "enemy" air defense opposition. As was noted during the critique, the well thought out classes and the high morale of all personnel in achieving the planned frontiers in combat and political training contributed to this.

The aviators of our unit, who have joined in the socialist competition to greet the 110th anniversary of V. I. Lenin's birthday and the 35th anniversary of the Soviet people's victory in the Great Patriotic War in a fitting manner, are improving their combat skill, persistently strengthening military discipline and order, and raising combat readiness in every way possible during their day-to-day military work. As always, communists and Komsomol members, excellent soldiers in training -- worthy successors of the combat glory of front-line heroes and the veterans of the last war -- are marching in the first ranks.

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AIR FORCES: NEED FOR FLIGHT SECRECY STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1980, p 26

[Article by Maj A. Petrov: "Secretely, Swiftly"]

[Text] The flight of fighter-bombers led by military pilot first class Capt N. Kazakevich arrived at the control reference point at the designated time and, having carried out an energetic maneuver, swooped down on the planned objective. A difficult task faced the aerial fighting men: to inflict a strike on an "enemy" airfield under difficult weather conditions (low clouds, limited visibility, and a strong gusty wind).

The aviators especially counted on flight secrecy, an unexpected arrival in the designated area, and the swiftness of the attack. They successfully coped with these. The first strike was inflicted from the move, putting the landing strip and on-duty interceptors out of action. During the second approach, the fliers--using cannon armament--fired from two directions at the aircraft located on the hardstands. The tactics, bombing and firing were given a high rating.

The flight's pilots -- leaders in a squadron of experts on combat employment -- are continuously increasing their successes in the socialist competition to greet the 110th anniversary of V. I. Lenin's birthday and the 35th anniversary of the victory over fascist Germany in a fitting manner. They prepare carefully and thoroughly for each group flight and all the more during tactical flight exercises. The progressive officers well understand that modern aerial combat -- which is characterized by high dynamism, fast flowing operations, maneuverability and large spatial dimensions -- imposes strict requirements on the professional and tactical training and the moral, psychological and physical tempering of the aviators.

Col Gen Avn I. Kozhedub, a three-time Hero of the Soviet Union, has pointed out: "The one who has an excellent mastery of an airplane and weapons, who attacks the enemy first, and who employs the necessary maneuver, will be victorious." Secrecy of actions, a lightening breakthrough to the objective, an attack from the move -- these are indispensable conditions for achieving success. Right-flank competitions always remind us of this.

Captain Kazakevich's subordinates began the preflight preparations for the combat employment assignment by processing the reconnaissance data, plotting the tactical situation which had taken shape by that time on flight maps, and defining terrain features. The following item is typical. The flight commander leading the second pair, Capt Yu. Kholodnyak, and the supporting senior lieutenants, P. Sinebabnov and N. Chernykh, did not simply transfer the location of the "enemy's" air defense systems and their strong points from the photos to the maps; they also plotted possible paths and areas for the defending forces' redeployment considering the time, terrain and weather conditions. This foresight is quite necessary. Under actual combat conditions, the enemy will not sit idle in one place; his detection systems will be especially mobile. This permitted the aerial fighting men to select the most secure route which provided secrecy and surprise of operations.

After some time, the flight maps were colored with conventional symbols. The control reference points and the time for passing them, the lines for combat maneuvering, and the locations of the men and equipment covering the strike objective had been noted. The fliers once again firmed up the modelling of each flight stage and the optimum tactical variants for approaching the target and attacking it.

There are quite a few of these variants and methods in the arsenal of the flight commander and the leader of the second pair and also of their supporting aircraft. The only question is how to employ them more effectively. It must be confessed that there are cases where an experienced flier, a mature tactician, is not in a condition to overcome an air defense covering detachment because he acts without initiative and does not take the enemy's strong and weak points into consideration. Before combat employment flights, a complicated tactical background is invariably worked out, and assignments which were performed earlier are analyzed in Kazakevich's flight.

This time also, they turned to the experience of past flights during the preliminary preparations in the flight. When discussing them, they thoroughly analyzed cases where one of the leaders made an error in the calculations and as a result led a group to the target late. Naturally, a surprise strike from the move was not achieved.

Captain Kazakevich said to his subordinates: "In an actual combat situation such a mistake can cost dearly. In an aerial battle, as you know, even seconds decide the outcome of a duel. During the coming flight, the time factor means a lot to us. We must inflict the strike on the "enemy" airfield at 1440. No earlier -- no later. Senior Lieutenant Sinebabnov is busy making the calculations more precise."

The flight commander's selection was no accident. Officer P. Sinebabnov, a leader candidate, was preparing for the examination for a firstclass rating. This is a critical stage for him on the path of combat improvement. Each flight on a tactical flight exercise is a genuine school of skill where a situation, which approximates a combat one as closely as possible is created. Here, character is forged; will is tempered; and the tactical, firing and navigation training of an aerial fighting man grows. Kazakevich wanted his subordinate, when he performed the calculations, to sense deeply the responsibility for the task entrusted to the group, evaluate all the complexities of the coming flight, thoughtfully model all the flight stages once more considering the time factor, and display initiative.

The time is not far away when Sinebabnov will lead a pair to the range on his own. On this score, Kasakevich had his own point of view, his own command policy which excludes formalism and excessive cautiousness in the training and indoctrination of the fliers.

Sinebabnov justified the commander's trust. He calculated with irreproachable navigation accuracy, and then in accordance with more precise data on the "enemy" he corrected the profile and time of the flight to the strike objective. It was not so easy to do this. The fliers had to operate in a complex tactical and weather situation, the route abounded in turns and passed near the location of the opposing side's antiaircraftmen's and missilemen's positions. It was impossible to avoid them safely without effective combat maneuvering. An encounter with interceptors was also not excluded. In a word, Senior Lieutenant Sinebabnov provided for a lot. The checking of the commander of the flight and then of the squadron showed that everything had been done irreproachably. This permitted the fliers to arrive at the strike objective secretly and on time.

Of course, preparations for the tactical flying exercise in the flight were not limited to only advance, preliminary and preflight preparations. Here, all the training of its fliers takes place in a combined way; practice is thoroughly corroborated by theory. The aerial fighting men use trainer equipment with good results. Incidently, the aviators overfulfill the plan for flights on a trainer every month. Each flight assignment is carefully modelled and is practiced using the "dismounted-flight" method.

Captain Kazakevich's subordinates make skilful use of the experience of experts, the better prepared aerial fighting men of the unit and squadron. During the hours of preparation for flights it is often possible to see in the flight officers S. Leychenko and A. Yachmenev and other experts in maneuvering and firing who eagerly reveal new methods and ways to wage aerial combat, and who help their colleagues acquire high moral-combat qualities.

It is known that the strength of a commander lies in his personal example, in his organizational capabilities, in his ability to work with the party and Komsomol aktiv. Captain Kazakevich regards shortcomings uncompromisingly and considers the struggle against them a reliable guarantee for raising the quality and effectiveness of combat training. The communists support him in everything. In the flight, all the fliers and the majority of the technicians are party members or candidate members. Therefore, each case of deviation from the laws of flight work, of violation of discipline, or of a careless attitude toward duties does not escape attention. A critical and highly principled evaluation is given to it. The commander and the entire collective demand an answer from the transgressor.

Such a work method brings positive results. All the fliers of Capt N. Kazakevich's flight fly smoothly, without reproofs, and perform their duties successfully. Two have a firstclass rating; Senior Lieutenant Chernykh has completed the training program for secondclass.

The successes are undoubted. However, the aviators do not preen themselves on them; they are not complacent. Every specialist--flier, technician, mechanic--

considers the achievement of the best a strong reference point for himself, and tries to construct a course to skill along it.

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AIR FORCES: AIRCRAFT ACCIDENT ANALYZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1980 p 27

[Article by Maj A. Drozdov: "An Incident on the Taxi Strip"]

[Text] The coolness of morning invigorated one pleasantly. The sun had just risen, and the air pierced by its rays was resilient and tangible. The bottomless cloudless blue of the sky was overhead. It seemed that nature itself was helping the young fliers master the aircraft which was new to them by offering excellent weather conditions for this.

Valeriy Syurtukov stood at the edge of the taxi-strip and sadly accompanied the missile carriers, which were departing for the sky, with his eyes. He was not flying today. He had been suspended from flying. Why? Recalling everything that had happened to him, the senior lieutenant shrugged his shoulders with the cold.

He reproached himself aloud: "I am guilty."

... Two days ago, Valeriy had taken off in the new machine for the first time. The aircraft reacted sensitively to the slightest movement of the control levers; extremely sensible automation simplified the flier's work in the cockpit. He had dreamed for a long time about this flight. The successful mastery of the missile carrier had opened up new horizons in combat formation.

The aircraft was approaching the third turn. The pilot let down the landing gear and flaps. The machine "hung" on the control stick, but Syurtukov balanced the force of the trim tabs and brought it into the turn. In contrast to a two-seater, the military fighter was steadier and, seemingly, "sat" more solidly in the air. There is also long-range homing. Valeriy checked the speed and altitude, established the glide angle, adjusted the revolutions, and, having reported to the flight director that he had passed the long range homing radio marker beacon, received confirmation to land. The plane approached closer and closer to the strip. The strip markers for a correct landing flashed by under the wing, and the machine -- gently touching the concrete slabs -- ran along the runway. The braking parachute was let out. The missile carrier quickly decreased speed.

However, the flight was still not ended. In accordance with the requirements of the documents regulating flight operations, it ends only after the plane has taxied to the hardstand and the engine is shut off.

The fighter rolled along the taxi-strip. The pilot thought. "Is the speed too great?" However, this thought disappeared in an instant -- the heart was so bright after a well concluded flight. To the front, the taxiway made a sharp turn. Syurtukov pressed his foot and only then saw that the machine was not entering the turn. Another instant and it went into the dirt.

The airplane was out of operation for a certain time. It will fly undoubtedly. The technicians will quickly bring it to an operational condition. However, how to correct the moral trauma of which he himself was guilty?

Syurtukov well knew that the taxiing speed must be selected depending on the condition of taxi-strips, the presence of obstacles on them, the flying weight, and the visibility conditions during the taxiing. He also remembered that the crew commander bears the responsibility for taxiing safely in all cases. He remembered to remember, but nevertheless he created the prerequisites for a flight incident. Where? On the ground .... It makes him ashamed to remember.

Nevertheless, what is the reason? It is not enough to say that modern equipment cannot stand a scornful attitude toward it. It is necessary to feel the machine. Practice testifies that the one, who operates his plane carelessly, underestimates the role of ground training and invariably suffers a failure. However, everything is not as simple here as it appears at first glance.

In mastering the fighter which was a new type for him, Senior Lieutenant Syurtukov had well covered all the stages in theoretical retraining and ground training, he had a good knowledge of the requirements in the documents regulating flight operations, and he acted intelligently and with initiative on the trainers. When he started the flights, he completed the check-out program successfully. His instructors, Capt V. Maratkanov and Sr Lt V. Chuklanov, and the other teachers who had taught the flier earlier were confident that he would have no trouble. However, here is the prerequisite. No one in the subunit was able to say specifically what led the flier to such a gross error. Without a doubt, its technical aspect was clear -- too high a taxiing speed. However, the main thing does not lie here. The reason for officer Syurtukov's failure was concealed in the moral aspect of the affair.

A concept like reckless driving exists. It leads people, who have not mastered the skill of driving, to serious errors and grave consequences. Essentially, it is a lack of discipline which is justifiably suppressed by any means in aviation.

Yes, the flying profession is unthinkable without love for the sky, thorough knowledge, and -- mainly -- without a sense of high responsibility.

Captain Vladimir Maratkanov, an experienced flight commander, commended pilot Syurtukov and singled out his conscientiousness, exemplary keeping of work documentation, and excellent flight training. Valeriy was one of the first ones in the squadron to be presented the badge of a military pilot secondclass, and was commended for his excellent actions when landing under stiff minimums.

Officers A. Cheldushkin and V. Kalugin were sincerely happy with their classmate's successes; however, at the same time they began to notice how his character was losing its luster and how faint notes of superiority were creeping into conversations with Syurtukov. However, none of them made a comment to their friend in time; no one spoke out directly, without beating around the bush, about everything that he was thinking concerning this. In other words, the soil was beneficial for the appearance of conceit.

However was the cause of what happened only in the flier's conceit? Should one think of his blunder as a phenomenon of a clear-cut lack of discipline or of lack of training? Even the most light-hearted flier hardly wants to make a mistake, the more so if it will evoke serious unpleasantness. It seems that here it is necessary to analyze the psychological condition of Syurtukov who had completed the flight and landing in a new fighter in an excellent manner. The happiness in the fact that the new machine was subject to him and the delight evoked by the capabilities incorporated in the plane's system deadened the sense of continuous watchfulness or more exactly of professional vigilance which accompanies an experienced pilot throughout an entire flight right up to the shutting down of the engine. The commanders had more than once warned Syurtukov in a timely fashion that it was impossible to relax even for a second; however, evidently in general form and without linking it to the specific conditions of carrying out a flying assignment.

Retraining on new aviation equipment is a rather complicated phenomenon both in the psychological and in the pedagogical aspect. To learn and to relearn is not the same thing. Commanders who teach youth know this well. However, they somehow forget that perception, attention, retention, and imagination have their own peculiarities during retraining. As a result -- an incident on the taxi-strip.

The aviators, who took part in the discussion of Lt Col V. Shipkin's article "A Sparkling Halo" [AVIATSIYA I KOSMONAVTIKA No 9, 1979), rightfully emphasize that a lack of discipline -- in no matter what form it appears -- leads in the overwhelming majority of cases to a flying incident or the prerequisites for one.

The sky does not forgive anyone for poor knowledge, insufficient skills, low exactingness on oneself, and defective preparation for flights. It severely punishes those who rely on an old baggage of knowledge and who do not work at improving themselves. Many years of flight experience, of training and indoctrinating aviators, and of operating equipment and weapons are included in the instructions for a flier and in the other documents regulating flight operations. A firm knowledge and punctual fulfillment of the requirements in these documents ensure a high level of flying discipline and create a positive attitude in aviators which contributes to the confident execution of assignments, accurate work at the airfield, and the efficient operation of modern aviation equipment.

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AIR FORCES: SHORT EXERCISE ON TACTICS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1980 p 37

[Article by Capt Yu. Andronov: "An Input for You ...."]

[Text] The short exercise on tactics has become an integral part of the preliminary preparation of aviators for flights. However, it only provides benefits when they treat its preparation and conduct with all seriousness, offering a game with models of airplanes and a mock-up of the range like real actions. As experience shows, if the game participants do not possess enough imagination, the effect is considerably lowered. Of course, a lot depends on the leader of the classes.

For example, when preparing the squadron for the exercises, the commander stated the subject of the short exercise on tactics briefly and formulated the training questions. The situation at the moment of inflicting the strike was reflected on the work map. The time and specific documents whose propositions had to be recalled to mind or learned all over again were defined for each fighting man.

The short exercise on tactics took place in the form of answers to inputs. The director posed the first input. "Everyone acts as the commander of the first flight. Your flight has approached the line: Lake Krugloye-highway junction, and has begun a turn toward the bend of the river. Evaluate the situation and give instructions to the supporting aircraft."

Many wanted to answer. First was officer V. Lebedev. He correctly pointed out that the zone of operations of the enemy's air defense guided missiles began on this line, and therefore issued an order to the supporting pilots, led the flight to a low altitude and increased speed....

Then the leader turned to Maj Yu. Yermolayev. The latter thought that after descending and entering the zone of operations of the enemy's air defense guided missiles it was necessary to begin energetic maneuvering in altitude, course and speed. In doing this, the probability of the flight being hit by air defense missiles was lowered considerably. Thus, from a tactical regard the mission was solved quite fully.

The next input. The enemy was using radio jamming in a broad range of frequencies. Communications with the command point and the supporting aircraft has been disrupted.

Sr Lt A. Kagorov decided to lead the pair to the target visually using the motions of the aircraft as controlling commands, and to attack from the move with the help of a maneuver variant performed earlier. He drew a sketch on the board and showed the order of actions for controlling the group.

Next, a question was addressed to Capt G. Ustinov, a flight commander:

"The first aircraft in combat formation have been fired upon by antiaircraft artillery. You and the supporting aircraft are located in the middle of the formation. Your actions?"

A smile appeared on the faces of the fliers. The fact was that during a recently conducted exercise Ustinov was in a similar situation. At the time he had led the group across the "front line" and found himself in the zone of fire of antiaircraft guns. Having noted the antiaircraft mounts on the ground, the commander brought his plane into a turn, being completely confident that the supporting aircraft would do the same thing. However, the fliers did not immediately understand the leader's plan, and the maneuver was stretched out and slack and, consequently, the "enemy" received an opportunity to conduct fire for destruction.

This flight showed the flight commander how important it was to practice coordination commands, flight coordination, and mutual understanding on the ground. Captain Ustinov took it as a rule to conduct training sessions on tactics and combat maneuverings during each preliminary preparation in order to improve coordination of actions and the development of tactical thinking.

Here and now, having received the input, the flight commander called to mind the situation and showed his solution using the airplane models.

The class continued. The leader assigned the fighter group the task of moving to an enemy airfield, searching for a camouflaged target, and selecting the strike method and appropriate maneuver.

There were many solutions. Then, the squadron commander changed the input. When attacking the target which had been detected in the northern part of the airfield, the leader understood that it was a dummy one, and when coming out of the maneuver, noted a hardstand for aircraft on the edge of a forest.

Silence descended in the classroom. Sr Lt A. Kharchenko, a military pilot first class, was called upon to answer. Having changed the position of the models in accordance with the input, he reported:

"I continue to search for the command point in accordance with the assignment, and redirect the second pair, which is flying behind at the range of visual contact and which can maneuver to attack the airplanes on the edge of the forest without complications, at the hardstand."

Many wished to add to the flier's answer. Each one was given an opportunity to express himself. Maj V. Tarkhanov proposed an original solution. The great capabilities of a fighter in maneuvering in altitude and speed were at the basis of his plan.

The short exercise on tactics and then the well organized gaming of the flights helped the fliers to achieve success during the exercise. The crews acted intelligently and displayed initiative and independence when solving complicated tasks. Despite the fact that the weather was unfavorable, they struck the assigned targets accurately.

However, another short exercise on tactics is also recalled. While preparing for it, the director evidently relied on an old baggage of knowledge and did not think up anything new when drawing up the inputs. The classes took place without interest. The fliers answered the question in a set pattern, as if they had learned the lesson by heart. There was no trace of arguments, inventiveness, or new or original solutions. As a consequence, this flight performed the flight assignments during the exercise below its capabilities.

The aerial training of fliers includes many components in itself, including good tactical training and the ability to think operationally in a complicated situation, make an advisable decision rapidly, and act quickly. The commanders, political workers and party activists of this unit pay very serious attention to the development of tactical thinking. Various training forms are used for this: meetings with veterans of the Great Patriotic War; educational, memoire and fictional literature; the exchange of experiences by exercise participants with young fliers; classes on tactics; and, finally, short exercises on tactics.

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AIR FORCES: NEED TO IMPROVE TECHNICAL TRAINING BASE STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 4, 1980 pp 30-31

[Article by Engr- Col A. Shelekh: "A Training Complex for Each Group"]

[Text] During the present stage in the development of aviation equipment, highly qualified and truly professional actions by engineer-technical and flight personnel are needed for the successful preparation of airplanes and helicopters on the ground and their correct operation during a flight. In accordance with this, the requirements on the methods for preparing aviators and for using the training base are changing.

The need for thoroughly sound use of new training aids is rightfully emphasized in the article "A Class is not an Exhibition of Novelties" (AVIATSIYA I KOSMONAVTIKA No 3, 1980). This question can be posed more broadly. You see, today's training base does not consist of classrooms and crew trainers; it is also a complete complex of objects using which it is possible to conduct theoretical and practical classes, seminars and training sessions. Of course, training classrooms in which there are functioning stands, a collection of posters which permit the operating principles of assemblies to be studied, functional diagrams and questions on the operation of all systems and units to explain possible mistakes by engineer-technical and flight personnel, and system trainers for conducting various types of training sessions, remain the heart of the training base.

However, from an instructional methods respect the equipment of adjustment operations groups and maintenance groups is becoming no less urgent an avenue in the development of the training base. These groups must have operating stands and mounts, diagrams and posters which explain the physical meaning of this or that operation when preparing aviation equipment for flights and when carrying out adjustment operations, and instructional methods training aids for studying the equipment and for using monitoring and measuring devices and testing equipment efficiently. The equipping of adjustment operations and maintenance groups with distinctive training complexes, on which young aviation specialists are taught what must be done on the airplanes (helicopters) and are taught to search out breakdowns in systems and assemblies, is being achieved in units.

Moreover, work positions for training personnel in repair operations on aviation equipment are being set up in each adjustment operations group and maintenance group.

This approach is typical of the work of engineers B. Kryuk and V. Lysenko. Without question, there are good classrooms in these subunits. In particular, Engineer-Major Kryuk devotes a lot of attention to the creation of functioning stands for the equipment mounted in a reconnaissance aircraft of the type being maintained. Here, it is possible not only to familiarize flight and engineer-technical personnel with the construction of the photographic equipment but also to teach them how to prepare the equipment, use it during a flight, and search out and eliminate possible breakdowns. A group of specialists -- enthusiasts in their work -- have created a classroom under the direction of Sr Lt Tech Serv V. Gayvoronskiy. In addition, each technical maintenance unit laboratory can be used for the practical training of personnel.

Engr-Maj V. Lysenko is seeing to it that the squadron's maintenance group becomes the base for the practical training of specialists in skilful maintenance of the aviation equipment. Maj Tech Serv A. Vinogradov energetically helps him in this. Here, they have also thought about having classes near the aircraft hardstands. They approach the manufacture of stands, graphics, trainers, and various set-ups in a creative way with a consideration for the operational trends and tasks being solved by subunit personnel in mastering aviation equipment.

For example, in the aircraft, engine and emergency ejection system classroom there is everything necessary for holding technical training classes: diagrams, posters, graphics, operating stands on the pneumo-hydraulic system, the braking parachute assembly, and the operation of the braking parachute assembly. A list has been drawn up for carrying out check-out operations on a bomber and its power plant and other systems. The entire process for organizing the preliminary preparation of the aviation equipment for flights is shown on one of the stands. Sr Lt Tech Serv N. Kopylov, chief of an excellent group; Sr Lt Tech Serv N. Bolokhov, a specialist first-class; and WO [Praporshchik] I. Kovalenko have worked a great deal on the classroom's equipment.

In the SD classroom, stands pertaining to objective control systems, to the observance of safety precautions when working on the aircraft, to the hydraulic and fuel systems, and to the air conditioning system have been soundly executed. There is also a graphic for testing the engine here. All the necessary parameters and graphs for the airfield technical support of aircraft are shown on it. A stand for the engineer-navigation computations for flights and for the system controlling the leading edge slats and flaps has been mounted. Capt Tech Serv V. Trachuk and his subordinates deserve a great deal of credit for the way the classroom is equipped.

Many original stands and new graphics have recently appeared in the squadron's laboratory-classroom for radio electronic equipment. When you enter it, the stand, on which the placement of an aircraft's radio equipment is shown, immediately attracts attention. On another stand, the method for checking the radio set assemblies is depicted, and panels for the tape recorder unit-circuits, the radio receiver, the SPU, the radio navigation system of local air navigation, and the radio compass have been mounted. All the work of designing the stands was conducted under the direction of officer I. Anashkin, the group's technician.

And how many interesting novelties can be seen in the classroom for a modern airplane's flying-navigational complex! Here, the cupboards for storing units, assemblies, and the technical documentation are of interest. Engr-Sr Lt S. Kovyazin showed himself in the best possible light in their preparation.

The fact that there is now a laboratory-classroom in almost every maintenance group of this squadron is especially gratifying. Studying the subunit's experience, the Air Force Engineer Services of the other squadrons are also persistently working to create their own training base. This endeavor deserves the support of the command element. This is one of the most important factors in further improving the aviators' technical training, raising their horizons, and developing their skills in effectively maintaining the complicated systems of third generation aircraft.

Based on officer V. Taranin's initiative, a training complex based on a covered aircraft hardstand was built. This complex is a standard one. It is possible to conduct classes in it which include the procedure for placing equipment and for keeping the documentation.

On-board system operation stands are placed in the covered complex; an aircraft is on the spot. It is easy to demonstrate on a model everything that is talked about here. It is always possible to conduct classes on anti-corrosion measures, on preserving and maintaining the varnish and paint coating in an excellent condition, and on marking patterns and signs. Training sessions on performing all types of preparations of an aircraft and its equipment for flight are held here. The basic information on a stand and what questions can be worked on it with the personnel are pointed out in the documents for each stand and system trainer. A register is also kept of all those who have undergone training on a stand or trainer.

A lot of attention is devoted to the creation of training equipment. Thus, system trainers for checking aneroid diaphragm instruments with the help of consoles have been built in all units. Using the console and equipment, the personnel practice methods for carrying out critical operations.

Besides studying operating principles, various ways to refuel are established on the aircraft (helicopter) fuel system operating stand. Flight personnel master the procedure for depleting fuel during a flight, signalling, possible breakdowns, and flight safety measures during these cases.

In one of the units, the flying-navigational stand is used in the adjustment operations group for working on the actions of a pilot during flight and the skills of the technician in preparing this complex for a flight.

The use of training equipment and system trainers in classrooms and in maintenance and adjustment operations groups increases the effectiveness of the training process and the practical skill level of flight and technical personnel in maintaining aviation equipment. Thanks to it, the supply of aircraft and helicopter complexes, systems and assemblies is also being preserved.

Classes on a well equipped training base contribute to broadening overall technical horizons and improving technical standards in performing work on aviation equipment. The specialists are concerned not only with the saturation on the classrooms but also with their esthetic appearance and the creation of comfort and appropriate temperature conditions so that personnel will work unhindered by flight and technical clothing, draw up a summary, and use the reading material.

The complexity of modern aviation complexes have led to the fact that a technical crew consisting of fighting men with many specialties prepares each aircraft for flight. Flight crews consist of two-three men or more. Therefore, the necessary preparation of airplanes for flights and their efficient operation in the air are only possible under conditions where every member of a technical crew and a flight crew has excellent knowledge and skills. From this comes the need to improve quality in conducting classes on technical preparation. A strict registration of absentees is important in order to organize additional training sessions with them.

The conduct of classes with the leading flight personnel deserves great attention. There are cases where some officers during classes on technical preparation are busy compiling planning tables or filling in flight operations graphs. This hinders them in broadening their horizons, and they remain at the same level of equipment knowledge which they had when they were flight commanders or deputy squadron commanders. At the regimental level, an enormously greater military and technical knowledge is demanded of officers. By falling behind in training, such officers permit violations of the rules for operating aviation equipment during a flight.

Indeed, this happened quite recently with a flier-political worker. When clearing up the causes for the mistake, it turned out that he had not attended classes for a long time, and was not even entered in a single class log. He also had not worked on his own. This case was the subject of a critique with flying political workers, pilot leaders and leaders of the Air Force Engineer Service. It once again testifies to the firmness of the thesis that knowledge of aviation equipment must be continously replenished regardless of one's position and experience.

In aviation units, command training days are established by orders of the commanders. Here, they try to have no carry-overs of classes, and they instil in personnel a sense of getting things done, accuracy, and exactness when working on an airplane.

Personnel must be psychologically prepared for lectures, group classes, and especially for seminars. Therefore, it is considered inadvisable to conduct such classes when flights are stopped. They have little effect and large losses of work time. When flights are stopped, it is better to conduct only training sessions and practical classes on the aviation equipment.

At the present time, you will not encounter commanders who underestimate the importance of the training base in the squadrons and groups. However, the difficulties in building such complexes in subunits are not always being overcome. The real duty of Air Force Engineer Service leaders is to mobilize the specialists' creative strength and activity in solving this important task. High combat readiness and operations in the sky and on the ground without flight incidents are primarily the result of well supported classes and training sessions which provide personnel an excellent knowledge of aviation equipment.

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AIR FORCES: CHIEF MAR AVIATION KUTAKHOV'S VICTORY DAY SPEECH

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 1-3

[Article by Chief Marshal of Aviation P. Kutakhov, Commander-in-Chief of the Air Forces and Hero of the Soviet Union: "The Victory Will Not Fade Through the Ages"]

[Text] Great events do not grow dim as they move into the depths of history. Over the course of time, their significance is revealed ever more fully, and people understand their greatness even more thoroughly. The victory of the Soviet people over fascist Germany, which was won 35 years ago, was truly an epoch-making event.

Generations will be replaced by generations and new exploits in work and combat will be performed by our great people, but that historic date -- 9 May 1945 -- will remain a joyous triumph in their lives.

The war, which was thrust on the Soviet Union by German fascism, was the greatest armed action of world imperialism's shock forces against socialism and one of the gravest tests ever endured by our motherland. The fate of the first socialist state in the world and the future of world civilization, progress and democracy was determined during this war.

The Great Patriotic War of the Soviet Union was the main and deciding part of the entire Second World War. The victory of the USSR was the triumph of all progressive humanity.

Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, writes: "Our victory was a great landmark in the history of humanity. It showed the greatness of our socialist motherland, it showed the omnipotence of communist ideas, it provided wonderful models of selflessness and heroism -- all this is certainly so."

While preparing for the assault on the USSR and the achievement of world supremacy, the fascists created a monstrous military machine. For the invasion of the Soviet Union, the Hitlerite leaders and their satellites prepared a blow of enormous power. A total of 190 picked divisions, -- numbering 5.5 million men, 4,300 tanks, about 5,000 combat aircraft, and more than 47,000 guns and mortars--were concentrated on the Soviet borders.

The war destroyed our peaceful life unexpectedly and terribly. At dawn on 22 June 1941, fascist Germany invaded our country treacherously without a declaration of war. Military operations extended on a broad front from the White to the Black Sea.

The suddenness of the attack, the numerical superiority of the enemy in men and equipment, and the very grave difficulties of the war's first stage did not break the fighting spirit of the Soviet fighting men and did not shake the steadfastness of our people. The Communist Party came forward as the organiser and inspiration of the struggle of all the people against the fascist invaders. It developed an all-embracing program for the struggle for the complete destruction of the aggressor, it united the front and rear area into a single combat camp, it mobilized all the material and spiritual forces of the country for the achievement of victory. Under the leadership of the CPSU Central committee, the entire life of the country was reorganized in a military manner within an extremely short period. The majority of industrial enterprises were relocated to the east and began to provide items for the front in an exceptionally complicated situation.

Having encountered stubborn resistance, the fascists were forced to commit newer and newer reserves to the battle. The defense of Brest, Leningrad, Odessa, Sevastopol', Kiev, Novorossiysk and Kerch' demonstrated the unprecedented greatness of the Soviet people's spirit and their readiness to defend each inch of native soil to their last breath.

The historic battle at Moscow was a significant event during the initial period of the Great Patriotic War. The main strike forces of Hitlerite Germany were concentrated here. Having worn down the enemy hordes in heavy defensive battles, the Soviet forces threw them back from the capital's walls. Our aviation, which had achieved operational air superiority for the first time, played no small role in this.

The victory at Moscow had enormous military and political importance because it debunked before the whole world the legend of the invincibility of the Hitlerite army and its air force. It was a witness to the growing skill of Soviet fighting men, including the aviators.

Large bloody battles raged on the banks of the Volga and near the foothills of the Caucasus. Here, the advance of the Hitlerite army was broken by the steadfastness of the defenders of Stalingrad and the Caucasus. Within the course of only six and a half months, more than two million people took part on both sides in the individual stages of the battle for Stalingrad. The enemy forces lost up to 1.5 million soldiers and officers during it, that is about one-fourth of the entire army strength operating on the Soviet-German front. The enemy suffered enormous losses from the strikes of our aviation. For example, from 19 November 1942 to 2 February 1943 alone, our four air armies and long range aviation completed 35,919 aircraft sorties and destroyed 3,000 enemy aircraft.

The mass heroism of the motherland's defenders and their very great determination and courage led to a fundamental change in the course of the Great Patriotic War. The strategic initiative firmly and definitively shifted to the Soviet fighting men.

In the North Caucasus, our fighting men in heavy battles wore down the fascist grouping which had broken through toward Baku and Tuapse, and then in the spring of 1943-- shifting to the attack -- inflicted a decisive defeat in bitter battles at Novorossiysk and Taman', in the Sal'skiye steppes, and at Rostov. The air battles over Kuban', which undermined enemy air strength, lasted for more than two months. This was a turning point in the general struggle for strategic air superiority on the entire Soviet-German front.

During the summer of 1943, Soviet forces frustrated the last of Hitlerite Germany's attempts to change the course of the war in his favor by means of a large offensive at Kursk. The enemy's calculations were not fated to come true this time also. A new and serious defeat shook their armed forces to the roots. In the battle of the Kursk Bulge, our aviation, having destroyed more than 3,700 fascist aircraft, completely won strategic air superiority and maintained it to the end of the war.

Subsequently, the large-scale strategic operations of the Red Army at Leningrad, on the right-bank of the Ukraine, in Belorussia, Moldavia, the Baltic area, the Crimea, and Soviet Zapolyar' led to the complete liberation of Soviet land from the facist invaders.

The largest battle of the Second World War was the Berlin operation -- the strategic completion of the destruction of the German fascist army. During it, a very large -- almost one-million-man--enemy grouping was utterly defeated. During the night of 1 May 1945, Soviet fighting men hoisted a victory banner over the Reichstag. After several days, the robber Hitlerite Reich ceased to exist. The war had ended where it had began.

The Soviet people and their fighting men had endured everything, they had undergone everything and been victorious, they had crushed the aggressors.

Three months later, the country of the Soviets, faithful to its allied duty and the obligations adopted by it, declared war on imperialist Japan. In less than a month, the Soviet army together with the armed forces of the Mongolian People's Republic had crushed the major forces of imperialist Japan -- the million-man Guangdong Army, and brought freedom to northeast China and North Korea.

Our glorious aviators, together with other fighting men, made a worthy contribution to the achievement of the historic victory over fascism. During the terrible war years, our aviation successfully protected the forces and industrial installations from air strikes, smashed separate groupings of the enemy's ground forces and aviation, conducted reconnaissance, maintained communications with the partisans, destroyed the men and combat equipment of the enemy, and neutralized objectives in the rear area of Hitlerite Germany.

During the four fiery years, Soviet aerial fighting men made 125,000 combat sorties. Our fliers destroyed 57,000 fascist aircraft in aerial battles and on airfields.

In battle with the enemy, Soviet aviators displayed unsurpassed models of courage, selfless bravery, and high military valor and inserted shining pages into the heroic chronicles of the homeland. They rammed fascist airplanes in the air about [illegible]00 times. The immortal exploit of Capt N. Gastello, who aimed his plane which had been damaged in battle at a crowd of enemy men and equipment, was repeated by more than 300 fliers and crews.

The motherland evaluated the exploits of the courageous falcons at their true worth -- more than 200,000 of them were awarded decorations and medals; 2,420 aviators were given the title of Hero of the Soviet Union; 65 of them earned this title twice; and the famous aces -- now Marshal of Aviation A. Pokryshkin and Col Gen Avn I. Kozhedub were three-time Heroes of the Soviet Union. Hundreds of aviation large units and units were elevated to guards, received honorary names, and were honored with military decorations.

In observing the 35th anniversary of the victory over fascist Germany, we are not forgetting that it was achieved by the joint efforts of many peoples. Fighting men of the Czechoslovak People's Army, Polish forces, the National Liberation Army of Yugoslavia and the partisan army of Albania fought against the common enemy together with the Soviet armed forces, and during the final stage of the war -- Bulgarian, Romanian and Hungarian forces. The fraternal Mongolian people provided considerable help to the Soviet people. The resistance movement which expanded widely in the occupied countries played an important role in the struggle against fascism.

The peoples and the armies of the states in the anti-Hitler coalition made a certain contribution to the overall victory over the enemy.

However, the decisive role in the destruction of fascist Germany belongs to the Soviet Union and its armed forces. From the first to the last day of the war, the main forces of the German fascist troops were located on the Soviet-German front. The war's outcome was decided here. A total of 607 divisions, which formed the foundation of the armed forces of fascist Germany and its satellites, were utterly defeated here.

Our victory in the Great Patriotic War was not accidental. Many of its sources are especially found in the very nature of the socialist social system and in the indissoluble unity of the army and people.

The Soviet armed forces were only able to win this great victory thanks to the wholehearted selfless labor of the heroic working class, the kolkhoz peasants and our national intelligentsia. The true creators of the victory are not only those who fought at the front but also those who smelted steel, served grain, built machines, ran trains, and forged victory in the rear area. In 1943, the workers of the Soviet rear area were already able to provide the front significantly more combat equipment than all the industry of fascist Germany was providing its army. And you know, 1710 Soviet cities and more than 70,000 villages and hamlets lay in ruins and ashes.

The main and basic source of our victory was the wise and tested leadership of the Communist Party. During the grim war days it was a great leader, organizer and general. The party sent its best sons; many prominent figures, including half of the Central Committee's members and candidate members; and many secretaries of union republic communist party central committees, obkoms and gorkoms, who had a great deal of experience in organizational and mass political work, to the front. Comrade Leonid Il'ich Brezhnev was at the front from the first to the last days of the war.

Communists and Komsomol members formed almost half of the personnel of the armed forces. The communists inspired the fighting men to military exploits by their personal example and passionate Bolshevist words. Millions of party members and candidate members gave their lives for the motherland during the war.

The Soviet people have lived for three and a half decades under peaceful conditions. During this time the country of the soviets has marched a long way in its development. With each year, its accomplishments in the construction of communism are ever more significant. The socialist society is developing dynamically, and the party's economic and social policy -- worked out by the 25th CPSU Congress -- is being confidently carried out.

City and village workers, in answering the party's call to work in an urgent manner, are achieving high production indicators and are trying to carry out the tasks of the 10th Five-Year Plan's final year honorably.

The CPSU's foreign policy activity is being built in close connection with the solution of domestic tasks. Faithful to Leninist precepts, our party is purposefully fighting for the sacred cause of peace and is resolutely coming out against the intrigues of imperialist reaction. This noble struggle has won for the country building communism high authority and the peoples' trust.

However, the international situation has recently become noticeably more complicated. Militaristic and reactionary circles headed by the United States have intensified their actions against the relaxation of tensions, are interfering in the internal affairs of other countries, are supercharging the military psychosis, are increasing the military budgets of the NATO countries, and are speeding up long-range arms programs, trying to change the relationship of forces in the world in their favor. The latest actions of the U.S. president are permeated with the spirit of the "cold war" and of hostility toward the interests of peace. The decision to deploy 572 American nuclear missiles, capable of hitting Soviet cities, in Western Europe is nothing more than preparations for an aggression against the Soviet Union.

Using the false propaganda of a "Soviet military threat" as a cover, the enemies of peace and relaxation are gambling on the defensive steps being carried out by the socialist countries and the events in Afghanistan.

The guilt for the present sharp "temperature drop" in the world lies wholly and completely on the imperialist forces, especially certain U.S. circles. As comrade L. I. Brezhnev pointed in his answers to a PRAVDA correspondent's questions: "On those who see in the relaxation of tensions an obstacle to their aggressive plans, to the enkindling of a militaristic psychosis, and to interference in the internal affairs of other peoples. On those in whom the habit of behaving impudently with other states and of acting in the international arena as if they were permitted to do everything."

The present Beijing leaders, who are pursuing expansionist and hegemonistic goals, are acting in a single harness with imperialist reaction.

The Communist Party of the Soviet Union has been forced under these conditions to take the necessary steps to see that the organization and technical equipping of the Soviet armed forces and the personnel's level of preparation, training and political indoctrination correspond to modern requirements. Marshal of the Soviet Union D. F. Ustinov, member of the CPSU Central Committee Politburo and minister of defense, points out: "The Soviet Union is maintaining the defensive potential which is necessary for the reliable protection of the Soviet people's peaceful life. It expends for military purposes only as much resources as is necessary to provide the army and navy with all types of modern weapons and combat equipment which the imperialists cannot consider."

Recently--thanks to the unremitting attention and concern of the CPSU and the Soviet government and to the persistent work of scientists, designers, engineers, technicians,and workers -- the appearance of our military aviation has been changed beyond recognition. Ever more modern combat complexes, and improved systems for controlling and supporting flights are entering the armament of Air Force units. Today, the Air Forces are a formidable and mighty branch of the armed forces which has been called upon -- together with the other forces and independently -- to solve important operational strategic tasks both in continental and sea theaters of military operations. The technical equipping of all aviation arms and services fully answers the interests of reliably defending out motherland's aerial frontiers.

However, with all the colossal military technical capabilities of the Air Forces, their main strength is the people in whose hands is this terrible weapon. The CPSU continuously performs enormous work in instilling in Soviet fighting men a sense of pride in their motherland, its people, and its great accomplishments in the construction of communism, and high civic responsibility for the defense of the socialist homeland.

In carrying out a scientific and complex approach to indoctrinational work, commanders, political workers and party organizations are ensuring a further growth in the ideological training and political activity of the men. Based on the CPSU Central Committee decree, "On Further Improving Ideological, Political and Indoctrinational Work", ideological life in the forces has been raised to a new and higher level. It has been directed toward improving the professional skill of the aviators and raising their sense of personal responsibility for the performance of military duties.

An important factor in further improving combat and political training is the socialist competition which has been broadly expanded in the Air Forces under the slogan "To sacredly carry out Leninist precepts, improve combat and political training, increase vigilance, and always be ready to defend the motherland and the great accomplishments of socialism."

A big role in the struggle to strengthen and steadily raise the combat readiness of aviation units and subunits belongs to party-political work. It embraces all the spheres of the men's life and activity, actively exerts influence on the fighting men's consciousness and hearts, rallies them around the CPSU, and mobilizes them for the successful solution of the tasks facing them.

The instructions and recommendations of comrade L. I. Brezhnev, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet,-- contained in his address to the voters of Moscow's Baumanskiy election district -- and the celebration of the 110th anniversary of V. I. Lenin's birthday have evoked a new surge of activity during the present training year.

Our glorious aviators, just as the fighting men of other branches of the armed forces, are greeting the 35th anniversary of the Soviet people's victory in the Great Patriotic War with high indicators in combat and political training. These have been enriched by the experience accumulated during the winter combat training. The initiators of the patriotic initiative are marching in the front. The personnel of the Red Banner bomber aviation regiment, which Col G. Treznyuk commands, and of other air force units and subunits are successfully carrying out the high socialist obligations which have been adopted.

The summer training period is coming. During this time of intensive summer work, commanders, staffs, political organs, and party and Komsomol organizations are placing major stress on mastering the complicated aviation systems; practicing tactical principles and combat employment methods; and training fliers, navigators and crews to conduct bold and decisive combat operations.

Today, the essence of aerial training and very high flying skill consists of each pilot and navigator being able to perform the most critical flight assignments with maximum effectiveness, hit air or ground targets with the first attack, and wage successful combat against a strong and crafty enemy.

The present generation of aviation fighting men is preserving and multiplying the revolutionary, work, and combat traditions of their people and the military fame of the heroes of the Great Patriotic War. Air Force personnel are making a worthy contribution to strengthening the defensive might of our beloved motherland by their irreproachable service, unremitting vigilance, and constant combat readiness.

In observing Victory Day, Soviet fighting men --just as all our people -- are demonstrating unflinching loyalty to communist ideals and their motherland and are full of determination to implement the historic decisions of the 25th CPSU Congress. Closely united around the Communist Party and its Leninist Central Committee, they are tirelessly improving their combat training, mastering modern weapons and equipment, and vigilantly protecting the peaceful work of the Soviet people and the great accomplishments of socialism.

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AIR FORCES: OFFENSIVE OPERATION IN WW II

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 6-7

[Article by Maj Gen Avn (Ret) M. Kozhevnikov, candidate of military science: "The Aviation Offensive"]

[Text] During the initial period of the Great Patriotic War, Soviet aviation, cooperating with the ground forces, solved various combat missions -- as a rule, in small groups. However, with the growth of the combat capabilities of front aviation and the requirements of the advancing troops for continuous air support and cover, new forms for its combat employment began to appear.

By the middle of November 1942, the formation of front air armies and the formation of ten aviation corps in the reserve of the High Command, which were armed with new types of airplanes, had been basically completed. By this time, more than 30 percent of the overall number of front aviation combat aircraft were in the aviation corps. The proportion of bombers and ground attack aircraft in the Air Forces increased (66 percent and the bomb load grew twofold). Thanks to this, the air armies operating on the main avenues were able to employ aviation in a massed manner during the offensive operations of the front's troops and execute a broad maneuver with aviation large units.

The command element of the Soviet Air Forces checked the combat capabilities of the aviation corps during a two-sided air exercise which was conducted from 5 to 15 October 1942 at a range near Moscow. A new way to organize the operations of aviation during front offensive operations -- the aviation offensive -- was born. The concept, "artillery and aviation offensive," appeared in the Combat Regulations of the Red Army Infantry. These new ways for employing artillery and aviation considered the experience from the first period of the Great Patriotic War and included uninterrupted support of the infantry with the massed fire of artillery, mortars and aviation throughout the period of the offensive. The Field Regulations of that same year pointed out that the actions of aviation during offensive combat take the form of an aviation offensive which consists of two periods: the preparation for the attack and the support of the attack and the operations of the infantry and tanks in the rear of the enemy's defenses.

For the first time an aviation offensive was planned and partially conducted by the air armies of the fronts during the counteroffensive at Stalingrad. Essentially, it consisted of continuous air support for the ground forces throughout the period of the offensive, including the preparation for the attack, the attack and the operations of the troops in the rear of the defenses. Thus, the command and staff of the 8th Air Army (the commander was Gen T. Khryukin) developed a plan for the first four days of the operation. This plan was approved by the front's military council. The plan provided for 2,363 aircraft sorties during the day and 1,500 at night. Seventy-five percent of the main efforts of aviation were concentrated in the zone of the 51st Army's offensive; the other forces were to operate jointly with the troops of the 57th Army. Unfortunately, the outlined plan was not completely carried out because of unfavorable weather conditions. However, this was the beginning. During all subsequent front offensive operations, the operations of aviation were planned as an aviation offensive. This was demonstrated especially clearly during the counteroffensive at Kursk. All branches of aviation operated continuously on the battlefield and in the operational rear during the entire operation and thereby guaranteed a rapid breakthrough of the enemy defense by the ground forces and a high rate of advance.

The air preparation for the attack was an integral part of the majority of front offensive operations. During this initial stage the enemy's defenses on the avenue of the main attack by the front's forces were suppressed, and favorable conditions were created for their shifting to the offensive. The preparation was divided into the preliminary (long) one and an immediate (short) one based on the nature of the tasks being solved and the time for conducting them. A preliminary preparation for the attack was conducted in those cases where a heavily fortified defense with a high density of artillery and infantry fire and powerful defensive structures faced the front's (army's) troops (the 1944 Vyborgskaya Operation, the 1945 Koenigsburg Operation). It began one-three days before the offensive by the troops. For concealment purposes, the preparation was conducted on a broad front, but with various bombing densities. In the sectors planned for the breakthrough, the bombing density at times reached 100 tons per square kilometer of target area.

An immediate air preparation was conducted,as a rule, by the forces of front bomber and long-range aviation jointly with the artillery during the night before the offensive or at dawn immediately before the attack by the infantry and tanks. In cases where an offensive began during daylight hours, the immediate air preparation was carried out by the strikes of large aviation forces in order to make use of their results right away for the troops' advance. The duration of the preparation at this time varied from 10-15 minutes to 1.5 - 2 hours. Thus, during the counteroffensive at Kursk a strike by the forces of several hundred daytime bombers and attack aircraft was made on the Orlovskoye Avenue on 12 July 1943 15 minutes before the attack. During the Belorussian Operation, 162 bombers inflicted a massed strike on enemy centers of resistance on the Orshanskoye Avenue before the infantry's attack. During the Berlin operation, 109 aircraft of the 16th Air Army of the 1st Belorussian Front made a strike on enemy headquarters and centers of defense 30 minutes before the beginning of the attack by the infantry and tanks.

Up to 1943, a massed strike by the forces of an aviation regiment or division was used during an immediate air preparation. During the offensive operations of 1943-1945 when the combat and numerical composition of air armies had significantly increased, a massed strike in which several air divisions took part was employed for breaking through a powerful enemy defense. Ground attack aircraft as a rule did not participate at this time. From 10 to 25 percent of the attack aircraft were involved only in individual offensive operations (1st Air Army during the counteroffensive at Kursk and during the East Prussian offensive operation). During some operations when an air army had no bomber aviation, the immediate air preparation was conducted by ground attack aircraft (the 4th Air Army during the Berlin operation).

The forms and methods for the combat operations of aviation were continuously improved during the war years. Thus, immediate air preparation was conducted not only before the beginning of the offensive but also during the operation -- before the front's mobile groups and second echelons were committed to battle and also during the battles for individual centers of resistance during the offensive.

The second stage of the air offensive is air support. At this time, ground attack aircraft and bombers neutralize enemy firing systems located in defensive positions echeloned in depth, cooperate with the front's troops in a rapid breakthrough of the defensive belt and in the development of the offensive, and help the troops to repulse counterattacks. Fighter aircraft provide air cover to the combat formations of the advancing troops. During operations in 1941, air support was carried out to a short depth in the majority of cases because of the insufficient number of aircraft and also because of the absence of radio equipment to control aviation over the battlefield. It was impossible to exert continuous influence on enemy installations. However, during the counteroffensive at Stalingrad, the efforts of ground attack aviation were successively shifted from one defensive position to another (the 8th Air Army when supporting the 57th and 51st Combined Arms Army). Although unfavorable weather did not permit flying in small groups, our attack aircraft operated in pairs, fours and sixes in accordance with an earlier worked-out schedule. When doing this, strikes were made against objectives not far from the advancing troops. This was achieved by accurately organizing coordination between the air large units and the supported troops and by directly guiding the attack aircraft groups to the target from forward air control points located with the combined arms command posts.

The troops made immediate use of the results of the air support to move forward. However, the limited number of attack aircraft and bombers still did not permit the command element to operate against enemy installations simultanously throughout the depths of their defense. Therefore, air support was carried out in succession by shifting the efforts of the attack aircraft from one defensive position to another.

Later, during an offensive by Soviet troops -- especially during the operations in 1944-1945, our aviation operated against enemy installations both on the battlefield and in the operational rear. The sharp increase in the numerical and combat compositions of the air armies contributed to this. For example, by the beginning of the counteroffensive at Kursk, the 1st Air Army had 1,322 combat ready airplanes, the 2d - 1,153, and the 16th - 1,043. During the Vislo-Oderskaya offensive operation the 16th and 2d air armies had 4,770 combat aircraft, and during the East Prussian operation there were more than 3,000 aircraft in the

1st and 4th air armies which were reinforced with aviation resources from the reserve of the High Command.

Air support for the troops during operations in the second and third periods of the Great Patriotic War were characterized by decisive massed forces on the main avenues. Thus, during the Belorussian operation on 25 and 26 June 1944 after breaking through the enemy's defenses on all fronts and committing the mobile groups to the breakthrough, the support and cover for the advancing troops became the main task of aviation. An attack aircraft, a bomber and two fighter aviation corps cooperated with the 5th Guards Tank Army of the 3d Belorussian Front. An attack aircraft and a fighter air corps cooperated with a cavalry-mechanized group on the 1st Belorussian Front.

Air accompanying support was the final stage of the air offensive and played an exceptionally important role in the successful solution by the front's forces of intermediate tasks and the achievement of the offensive operation's final goal. When the mobile groups moved forward, and were separated from combined arms armies and when the troops' communications were stretched, aviation remained the only means for supporting and covering them from the air in the enemy's operational rear. Therefore, the air accompanying support of the troops was carried out by specially selected air large units which operated, as a rule, on call of the aviation representative from the forward command post of the combined arms commander. When pursuing the enemy, aviation destroyed their operational reserves, fought in the air, provided cover and direct support to the advancing troops, and provided them with reconnaissance data.

Thus, Soviet military art was enriched during the war years with a new method for the operational employment of aviation during front offensive operations. The aviation offensive depended primarily on the quantitative growth and qualitative composition of our Air Forces and the need for uninterrupted fire pressure on numerous enemy objectives hindering the advance of our troops. The success of an offensive was ensured by accurately planning the combat operations of aviation jointly with combined arms staff; by moving air control points closer to the command posts of combined arms commanders; by organizing the guidance of aircraft from radios on the forward edge; by creating special systems for designating the forward edge of friendly troops, and by introducing signals for target designation and mutual recognition of friendly troops and aircraft.

The term "aviation offensive" is not used at the present time; however air preparation, air support and air accompanying support reflect the essence of the tasks which aviation must solve at a given stage for the sake of ground forces who are conducting an offensive operation.

Modern aviation has at its disposal aircraft for different purposes which possess immeasurably greater flying, tactical, and firing capabilities as compared to their forerunners at the time of the Great Patriotic War. The ways and methods for employing them during combat have changed. However, the principles born in fierce battles against a strong and cunning enemy remain immutable, and the experience obtained by the front-line generation in battle is a priceless treasure from which today's aerial fighting men can arm themselves with everything useful that answers the spirit of the times, and improve in conformity with the new equipment so that the combat readiness of our glorious Air Forces is raised even higher.

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AIR FORCES: WAYS TO IMPROVE FLIGHT SAFETY DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 16-17

[Article by Marshal of Aviation I. Pstygo, Hero of the Soviet Union and Honored Military Pilot of the USSR: "Modern Demands on Flight Safety"]

[Text] The pride of our aviation are the regiments and squadrons which have been solving complicated combat training missions for a long time without accidents. The thoughtful inculcation of respect for the laws of the flying service, of irreproachable execution, and of a sense of personal responsibility for the exemplary performance of military duty in the men, especially the fliers, determines such high results.

The matter was decided this way in the Red Banner bomber air regiment where Col G. Treznyuk is the commander. The personnel of this regiment have come forward as the initiators of the competition in the Air Forces under the slogan "Sacredly carry out Leninist precepts, improve combat and political training, increase vigilance, and always be ready to defend the motherland and the great accomplish- of socialism." There have not been any flight incidents here for 15 years.

Firm military order and correct organization and discipline are maintained in the unit, and an atmosphere of such exactingness and demandingness has been created that even the slightest deviation from the requirements of the course and manuals receives stern censure.

The systematic and purposeful concern of the command element and the party and Komsomol activists for the professional skill of all fighting men -- without exception -- who participate in flights and in their support affects the achievement of the successes. The classes, training sessions, work on the aviation equipment, and the flights themselves are planned and conducted so that the aerial fighting men and the other specialists will enlarge their reserve of knowledge and skills, improve their moral and psychological training, and learn to coordinate their actions with respect to the target, place and time correctly with the actions of their combat comrades in order to solve the overall task in an exemplary manner.

In those units where flying incidents have not been eliminated, one unfortunately has occasion to encounter deviations from the requirements in guidance documents. For this reason, errors; the preconditions for flight incidents; and gross blunders which destroy the rhythm, lower the quality of the aviators' combat training, and inflict definite moral and material losses, arise.

When you think about why it happens this way, when you analyze and compare negative facts, when you investigate the preconditions or the incident, you invariably come to the conclusion that all of them arose because of a disregard for the laws of the flying service. These laws, which are stated in manuals, instructions, orders, and the other documents regulating aviation life, must be observed especially strictly in the age of supersonic aircraft equipped with powerful weapons and very complex equipment.

Under modern conditions, both time and a large expenditure of work and physical and mental energy are required for the total mastery of flying skill. Everyone understands this. However, individual commanders sometimes permit a simplified approach to training and do not take into consideration psychological and pedagogical requirements. Such a position is inadmissalbe; it cannot be justified in any way. any assignment will be carried out with high quality if the measures which are included in the series or cycle of flight work are conducted fully and correctly.

This cycle includes the making of the decision on the flights; their planning; the preliminary preparation for the operations of the aircraft (helicopter) crews, specialists and systems supporting the flight; the flights themselves; their control; and the critique of the flights based on information from the objective control systems.

It is completely understandable that a commander must now be a true psychologist, instructional methodologist, teacher, and organizer in order to make maximum use of the capabilities of every flier to raise combat readiness. To do this it is necessary to evaluate in detail, in correlation, and in mutual relation the capabilities of the men and equipment, time calculations, and the contemplated meterological and air situation; to weigh all the "pros" and "cons" more than once and perhaps more than twice; to consult with subordinates; and to take their suggestions into consideration.

The main thing, it seems consists of the commander -- when making a decision and issuing an order for the flights -- closely foreseeing the sequence for carrying it out and the measures needed during negative occurrences which are dangerous for flight operations. This creative and genuinely scientific and self-critical attitude toward the matter characterizes at any given moment a modern air commander who treats the duties of his position conscientiously and responsibly.

Flight safety depends a lot on the planning for them. The planning table is a mirror of the flying day which reflects both the tasks as a whole and the actions of the personnel in detail. Meanwhile, in individual units they still consider this work -- without any justification for it -- as almost mechanical. They say the conventional symbols have been plotted, the documents have been countersigned with the signatures of the appropriate chiefs -- and that is all.

Such a view is thoroughly false. Any, even at times the most insignificant, mistake in its compilation conceals in itself a threat to flight safety. For example, it cannot be considered normal when the intensity of flight work continuously -- and sometimes also rather sharply -- increases from the beginning to the end of the shift. Some people get tired and the equipment during the flights needs more careful preparation and thorough inspections. This means that they act correctly in those places where the rhythm of flight work for a day (night) -- if you picture it in the form of a line -- appears during planning as the upper position of a trapezoid with rather gently sloping sides.

The time for preparing the men and aviation and special equipment is determined in each specific case by the commander. However, not so much the quantitative but the qualitative aspect of the matter is important during its conduct. The commander personally and through his deputies must see to it that every aerial fighting man and member of the group, directing the flights, accurately and fully understands and has worked out on the trainers or gamed everything that is required of him when solving the assigned task, and that the work provided for on the aircraft (helicopters) has been completed by the designated time with high quality. Only with the strict observance of this rule is it possible to count on a growth in the personnel's training and an increase in flight safety.

The role of independent preparation for flights is generally known. I would like to direct attention to the need to bring to light during it the burning questions connected with the more complete and effective use of our airplane's and helicopters' combat qualities and the performance of assignments without flight incidents and without the preconditions for them.

The following question is a very important one. Young flight personnel commit a certain number of mistakes as a result of gaps which arise during independent preparation. Why does this happen? The fact is that some lieutenants do not receive sufficient skills in preparing for flights on their own within school walls. The teaching of this to them is the direct duty of commanders and chiefs. Here, in my opinion, specially organised classes will play a positive role.

As is known, preliminary training in all cases ends with a check. During this period, it is extremely important to determine with the utmost accuracy the actual readiness of a flier or other specialist for intelligent and skilful actions, and to be convinced that the individual will act as is required during a very complicated situation when a non-standard situation arises. If a commander feels that a subordinate is experiencing difficulty in something or has not fully looked into it, he must give him additional time to eliminate the gap and conduct a second check.

The flights themselves are the apogee of the flight operations cycle. Here, the concerns of the commander who is organizing them are quite a few: study in detail the conditions taking shape, conduct a very careful reconnaissance of the actual weather, study the forecast, and firm up the decision. Everything must be considered and foreseen. The slightest detail must not be overlooked. Foreseeing the development of subsequent events in detail means to dependably guarantee oneself against the cropping up of many mistakes during the flying day.

Today, flight safety depends in a decisive way on the actions of not only flight personnel but also the people in the directing group. Their training is now organized on a solid base using specially equipped classrooms and trainer sets. A lot of success in the performance of the duties of one's position is guaranteed to those officers who have an excellent knowledge of, and fully use the capabilities of the radio technical systems -- the material basis for the modern direction of flights; who effectively analyse arriving information; who have a clear picture at any moment of the model of the way the situation is developing; and who are ready to react to it quickly and correctly.

It is understandable that the necessary order in the air and on the ground will to a decisive degree depend on the exactingness of the flight director, on his ability and skill in accurately assigning zones of responsibility between the GRP specialists and on the maintenance of reliable, flexible and steady communications. "I see -- I hear -- I control." This rule must be the slogan for everyone who has been entrusted with helping flight personnel and guiding them during the stages of a flight.

Deputy commanders, staff officers and other chiefs -- each at the place assigned to him - can do a lot for flight safety. Their personal example in performing service duties, high execution ability, principles, observation, and capability to eliminate detected shortcomings and help one who needs it, are always a reliable covering detachment against various types of mistakes, lack of coordination, and failures. Conversely, a lack of initiative in the guidance element, spinelessness, superficiality, and forgivingness invariably involve sooner or later unfortunate blunders and significantly lower the quality of flight operations and the combat readiness of a unit or subunit.

I would especially like to talk about the position of the regimental commander during flights from the point of view of ensuring their safety. For example, more than once I have had occasion to meet officer directors who try to be the first into the air immediately after completing the preliminary preparations. Do they act correctly? Undoubtedly not. Such actions are not justified by any kind intentions whatsoever. A commander, who is truly concerned about high flight safety, is at first located where the unfolding of events can best be seen and where it is possible to influence them -- normally beside the officer in charge of flying. He carefully observes the realization of his plan, and -- if it is necessary -- introduces some correction or other. Only after convincing himself that everything is going as planned, does he set off on the flight on his own or as an instructor. At the end of the relief, this commander is again on the ground -- he watches its progress, analyses and amasses data, compares it, and prepares material for the critique.

The cycle of flight work is completed with a critique during which successes and failures are analyzed and recommendations are given for the future. The information from the objective control systems permits the commander, instructor or Air Force Engineer Service officer to evaluate objectively and extremely reliably the flight which was carried out. However, it is necessary to state that all officer-directors still have not mastered to the necessary degree the equipment for processing material from the objective control systems and the art of deciphering it. It is for this reason that some evaluations of assignments are given during critiques based only on the subjective conclusions of the trainees, and the analysis between flights during the shift is done without express information from the testing and recording instruments. Naturally, their quality does not answer the requirements of the times, and the evaluations are often overstated. This damages the task. It is necessary to wage a resolute struggle against this vicious practice.

The months of spring are a time of unstable weather. Strenuous flights are taking place under complicated meteorological conditions. The directing elements of regiments and squadrons are trying to carry out the combat training plan fully. The desire is laudable. However, it must not give birth to rush work. Only a consistent shift from the simple to the complex will permit the successful conclusion of assigned tasks and the creation of good work done in anticipation of the future. Haste and a simplified attitude toward flight work invariably leads to an individual not being successful in mastering what he must learn, and as a result he goes to the assignment unprepared and makes mistakes in his actions controlling an airplane or helicopter and in their combat employment.

As the tasks proposed by life grow and as aviation equipment becomes more complicated, flying discipline, teamwork, and accuracy play an ever larger role in improving safety. By using the various forms and methods of indoctrinational and party-political work, senior chiefs, political workers, and officers on the staff and in the services systematically and purposefully teach fliers, commanders and other aviation specialists punctual execution and critical analysis and evaluation of personal actions. The flying longevity of many aerial fighting men, who have travelled the path from ordinary fliers to leaders of military collectives, was caused not only by their good health, thorough knowledge and firm professional skills but also by the fact that they never went contrary to the laws of the sky, did not permit any liberties or moves outside the prescribed flying limits, and at any given moment knew exactly what they could do and not do.

Here is what happens if a flier acts otherwise. Several years ago, a group of officers and I had to investigate the circumstances of two flying incidents which had occurred within a relatively short period in the squadron which officer V. Sobolev commanded at the time. They arose as a result of the neglect of their duties by many officials; however,the main culprit in both cases was Sobolev.

On the first case, he displayed arbitrariness in spite of the instructions of the senior chiefs and decreased the altitude for the crew during the most difficult stage of the flight. In the second, he personally landed the aircraft with a larger residue of fuel than is prescribed. The men did not perish only because of a lucky chance.

In the unit, they characterized officer Sobolev in a positive way. He, even after he received one bitter lesson, continued to think he had a right to treat the laws of the flying service freely and to violate them at his own discretion. The conclusion is a simple one. The individual was not able to recognize the responsibility placed on him; as they say, in spite of the promotion, he did not grow up to it. Officer Sobolev had to leave the sky.

The requirements of the guidance documents have absorbed all the experience and all the achievements of modern aviation. There is nothing minor or non-obligatory in them. By observing them steadily and by displaying discipline, execution and initiative in matters big and small, our best fliers are achieving steady successes in the growth of combat skill and in raising flight safety.

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AIR FORCES: PREPARATIONS FOR CLASSIFICATION EXAM DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 18-19

[Article by Col E. Yesipovskiy, honored military pilot of the USSR: "A Difficult Examination"]

[Text] The helicopter smoothly broke away from the ground and headed for the firing range. A group of officers from the classification commission and the control element for the flights was in the passenger cabin. They were to evaluate results during the combat employment of airplanes piloted by fliers secondclass. We will immediately point out that these flights are not quite normal. Their peculiarity consists of the fact that they are the fliers' final examination for the right to be awarded a higher rating.

After some time, the rotary-wing machine landed in an area near the range. There was time and it was necessary to check the readiness of the director and range detail for the work and to inspect the machines.

We had already been here. A well known situation and target field. However, the range equipment had been recently improved; new mock-ups, which had been skilfully placed and camouflaged, had appeared. This time, the individual fliers would operate against an air defense missile complex position. After the inspection, it was clear that it would be a complicated task to find it on the move under wooded terrain conditions without reference points, set up a maneuver correctly, and neutralize it. Well, the more difficult the task, the more deserved would be the high rating for its correct solution.

At the command post, we together with a representative from higher headquarters and the flight director thoroughly evaluate the air and meteorological situation. Everything is coming together well. It is possible to carry out the planned assignments. The readiness of the rage is reported to the airfield and after several minutes the combat aircraft take off from it.

Once again, I look at the flight planning table. Captains A. Ryazanov, V. Vysotskiy, G. Cherepita.... We met each one of them during the check-out inspection of their theoretical knowledge. All those examined received good and excellent grades and it was no accident. In order to fly in a modern airplane, a flier must know it perfectly and operate it intelligently on the ground and in the air. He must understand aerodynamics, be able to use the advantages of his machine, know the weak points of the probable enemy's equipment, evaluate the air situation rapidly, and make a correct decision which leads to victory. Thus, the equipment, aerodynamics and tactics are disciplines without which one cannot form a dependable aerial fighting man, a flier with high qualifications.

However, comprehensive theoretical training is only the foundation for acquiring and improving skills in piloting an aircraft or helicopter and for the ability to put the knowledge received into practice. A flier polishes professional skill during flights. The quality of this work depends entirely on how the flight training is planned and how methodologically correct the instructors train subordinates.

It is necessary to say that the command elements of units are paying a great deal of attention to the training of flight personnel to raise classifications and this is understandable. The rated qualification primarily characterizes a flier's or navigator's level of readiness to conduct combat operations under these or those conditions and the degree of his professional maturity. Consequently, the desire of commanders to have as many highly rated fliers as possible reflects their concern for the growth of subunit and unit combat readiness.

Candidates for raising classifications are chosen carefully. The level of a fliers' theoretical training is discussed in instructional methods councils and all their capabilities are weighed. Personal flying improvement graphs are drawn up considering that a flier can be prepared with high quality to pass the established norms without haste and violations of the instructional methods sequence.

Basically, flight personnel mastered theory on their own. Special attention was paid to the types of disciplines. The more experienced, highly qualified, and authoritative specialists conducted lecture , practical classes and tutorials. Methods, defining the volume and sequence of studying the material,were worked up in each discipline.

For example, when studying practical aerodynamics, major stress was placed on acquiring a thorough knowledge of the aerodynamic characteristics of his airplane. Without this, it is impossible to select the type of combat maneuver correctly. Let us admit that the aircraft polar, required thrusts, proposed attack angles, aerodynamic factors, the aerodynamic quality, the flight speed and altitude operating range, the land factor capability of the aircraft, etc. are not abstract concepts. A flier must have a clear picture of all this. Thus, knowing the changes in the required thrust of the aircraft depending on the speed, altitude and load factor, it is not difficult to estimate the aircraft's maneuvering capabilities. Without having a picture of the extreme attack angles and the criteria for controlling an airplane during them, a flier can overbalance the control stick and go into a spin.

Therefore, strict purposefulness in training is fully justified. At the same time, when studying maneuvering and piloting characteristics, they saw to it that each flier firmly mastered how climbing figures and maneuvers in the vertical plane with and without afterburners and turns in the minimum time and with maximum angular speeds are performed and how the stability and controlability characteristics are changed when making figures and maneuvers over a broad range of speeds.

The results of the tests convincingly proved that the fliers had the necessary knowledge for the efficient operation of an airplane in flight.

Tactical training was conducted just as thoroughly. When defining the ways to improve the flight personnel's tactical training, the command element proceeded from the fact that the empirical path to a knowledge of the principles and ways for employing modern aircraft in combat without thorough theoretical training is now completely inadmissable because too dear a price must be paid for tactical ignorance. Therefore, the study of tactics first presupposed mastery of theoretical propositions. The basics of tactics were studied during lectures, seminars, and mainly independently. During independent work, an opportunity is offered to regulate more carefully and at one's own discretion the relationship between the volume of the material and the time, and to use all the necessary training aids and other sources. Thus for example, the propositions in regulations and manuals do not always fully embrace some sections of tactical theory. Theoretical knowledge must be expanded by studying text books, handbooks, military theoretical works, and military periodicals, and must be reinforced during short exercises on tactics.

Here, experienced staff workers helped. The necessary literature was selected in the libraries and was recommended to the fliers who were preparing to pass the examinations to raise classifications. If some book or other was not in the unit, they got it from the libraries of higher headquarters.

The work performed showed that the fliers' outlook expanded significantly. During the examination, they readily oriented themselves in the assumed situation and solved tactical tasks rapidly and efficiently using all their theoretical knowledge.

As is known, solid training on the ground precedes the successful performance of an assignment in the air. When preparing for a flight, fliers thoroughly think it over from take-off to landing. The quality of piloting an airplane, especially in a closed cockpit, grew with each shift. This success was the result of the work of experienced instructors and of the efficient use of the flight trainer. Every hour of work on the trainers was demanding. In the plan schedules, training sessions were provided not only for the days of command training and preliminary training but also for servicing days and during flights.

A great deal of attention was paid also to the organization of objective control. Today, there is no doubt that objective control permits a commander to influence the aerial training of a flier continuously, follow the formation of his skills in flying and combat employment techniques, complicate tasks in a combined manner for him, detect mistakes -- even those which sometimes he does not notice himself, and carry out preventive measures to prevent them. In this connection, a mobile laboratory and classroom for objective control were outfitted with the necessary equipment. Moreover, an analysis group, which could evaluate in detail the quality in the performance of a flight assignment, was created.

This approach to the use of objective control systems, which does not differ organizationally from objective control in other units, provided an opportunity to improve its quality. The instructors received this qualitative material and based on it were able to explain to the fliers specifically and with aerodynamic substantiation the mistakes made during a flight.

... Capt A. Ryazanov's report issues from the loudspeaker.

"This is 534. On the combat. Permit me to work."

"534, permission granted", the flight director at the range answered.

The roar of a jet engine suddenly tears assunder the silence. An airplane, flying at low altitude, shoots past in the direction of the target. Then it makes a complicated maneuver and turns to dive. In a second, a shaft of fire erupts from under the wings. Another instant and powerful explosions arise in the area of the target.

The observer reports: "A direct hit on the target designation station."

The other crews arrived at the range strictly on time. Their work was exact, and the bombs and shells accurately hit the target. The aerial fighting men had passed the difficult examination with a rating of "excellent."

When we left the range command post, the sense of deep satisfaction did not leave us. These lads can be relied on. They are worthy defenders of our wonderful motherland's aerial frontiers. Such fliers will wear the badge of a military pilot first class on their chest with honor.

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AIR FORCES: KOMSOMOL MORALE RAISING DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 p 19

[Article by Yu. Polezhayev. "From the Assigned Line"]

[Text] The group of aircraft arrived at the designated line exactly at the calculated time and inflicted an accurate and crushing blow on the "enemy." Among those who were flying the powerful combat machines that day was Sr Lt A. Kirikovskiy who -- just as the other aviators -- had spent quite a bit of effort and energy to achieve success.

A military pilot third class, the young communist is tirelessly improving his professional skill and preparing to raise his rated qualification. Persistence in achieving goals, a strong character, and inquisitiveness are helping him in this.

Kirikovskiy is a good mixer and knows how to organize people. It was not without reason that the Komsomol members of the detachment elected him their leader, and the lieutenants in the unit selected him to be their representative on the junior officer council.

Aleksandr devotes a lot of time to public work. For example, the thought arose to organize a Komsomol - youth evening on the subject "Heroes of the Great Patriotic War". The secretary talked with the Komsomol activists and members of the junior officer council. They supported him. The squadron commander and his deputy for political affairs and the secretary of the party bureau approved the idea. They decided to invite Ya. Pavlov, a Hero of the Soviet Union and a famous defender of Stalingrad, to the evening get-together. They sent him a letter. Here is happy news. The veteran agrees to come to the aviators.

It is difficult to express the feelings which seized the aerial fighting men when they listened to Yakov Fedorovich's emotional story of how the small heroic garrison under his command beat back for 58 days the fierce attacks of the Hitlerites who had burst into the city.

The viewing of a documentary film on the defense of Stalingrad and the exploits of its defenders made a big impression on the evening's participants. At the conclusion, Hero of the Soviet Union Ya. Pavlov expressed the wish that the young aviators would sacredly defend and multiply the glorious traditions of the front-line soldiers and cherish their motherland as the apple of their eye.

A contest for the title of best aviation specialist was conducted in an interesting way. Not only soldiers and sergeants but also the young officers took part in it.

There are quite a few famous actions to the credit of the detachment's Komsomol members: absorbing lectures and discussions, interesting excursions to sites of military battles, fiery debates and discussions. All this creates a good mood in the collective and evokes a desire to achieve new successes in combat training and socialist competition. By publicizing the experiences of the best young aviators, the Komsomol members are actively helping the commander and the detachment's communists in its dissemination. The personal example of the Komsomol secretary also plays a big role. By competing with Sr Lt V. Drachenko, one of the best specialists in the unit, A. Kirikovskiy is achieving high results in combat training.

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AIR FORCES: PSYCHO-PHYSIOLOGICAL FACTORS OF PILOT SUCCESS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 22-23

[Article by Lt Gen Med Serv N. Rudnyy, doctor of medical science: "The Individual During a Modern Flight"]

[Text] Each time he separates from the ground, a flier experiences sensations which cannot be compared with anything. The immense space; the splendid panorama which opens up before his eyes during the climb to altitude; a flight near the ground when the reference points speed by swiftly under the fuselage, and in his hands is the control stick of a powerful machine which is subject to any movement by the flier -- all this gives birth in him to an amazing feeling of meeting the sky. This feeling does not pass with the years, but on the contrary, is continuously strengthened and grows into a love which accompanies an individual all his life.

However, a flight is not only a sensation. It is first of all work: complicated and specific in content and structure, which makes enormous demands on the psychological and physical condition of an individual who is controlling a flying machine. No matter how improved the equipment is, a flight remains a flight, and the task of thoroughly supporting it remains pressing. Moreover, it requires the ever increasing attention of the specialists and thorough and comprehensive research.

In all the diversity of these problems, the dependability of an individual during a flight, his psychophysiological readiness for unexpected situations, and his sense of responsibility for the performance of the combat mission have special significance since they are dialectically connected, conditioned by each other, supplement each other, and in general reflect a flier's readiness to solve an assigned task in the air. Let us look at these components in order.

1. Dependability

In order to carry out a complicated and critical assignment, a regimental commander must pick the best prepared crew.

"Who will fly?" the representative of the higher headquarters asked.

Having thought for a second, the commander said: "Major Kuznetsov."

The senior chief inquired what had guided the commander in making the nomination.

The answer followed: "Kuznetsov solves any task as required. A dependable flier."

The officers present during this approved the commander's words.

A dependable flier .... It seems that this is an exhaustive recommendation for a specialist. It includes the summarized evaluation of an aerial fighting man's physical, moral, political, and psychological training as well as an evaluation of his knowledge and skills in operating aviation equipment and weapons, that is, the entire totality of the moral and combat qualities inherent in people in the flying profession.

The dependability of a flier is made up of well known components. However, let us look at what aviators themselves say about this.

In one aviation unit, Capt Med Serv A. Anisimov distributed a questionnaire, which had been approved by the commander, among the flight personnel. It asked from where a pilot drew confidence in the successful performance of a flight before the take-off. Was he always sufficiently prepared to meet special situations in the air? Did they take him unawares? What character features most of all correspond to people in the flying profession? What influences the formation of an aerial fighting man best?

These questions interested the aviators. Each flier understood that they were evoked by the desire of the command element and the doctor to know more about the level of the subordinates' moral, political and psychological preparation, and perhaps, find some new training and indoctrinational work methods and forms. Therefore, the answers were, naturally, frank and contained much valuable information.

When answering the first question, the fliers were unanimous: faith in a flight's success is born thanks to careful preparation on the ground. Independent work, a thorough delving into the essence of the assignment, and the thinking through of each element and action permit the creation of a model of the coming flight in the mind, and consequently, the avoidance of mistakes. Coaching and blind copying of the instructor's actions do not contribute to high quality in flight training.

The study of the signs of breakdowns in systems and units, of the situation, and of actions in accordance with the strict procedure provided by the instructions for a flier, precedes confident actions in special situations. Moreover, the periodic analysis of the preconditions for flight incidents, which have occurred in units, and the practicing of the necessary operations on a trainer permit the development of a definite stereotype of actions and create the impression that the flier has already encountered such situations. This makes it easier for him to make a timely decision and act correctly in a non-standard situation.

Concerning character, strong will and coolness, which permit a flier to implement his plan on the ground and in the air purposefully and to act calmly and prudently in a critical situation, were recognized to be its most important features.

Indeed, the flying profession justifiably is considered one of the most courageous and heroic ones. In order to rise to the heights of professional skill, it is necessary to develop strong will qualities in oneself. A strong will is not an inborn character feature. Its breeding begins with increased exactingness on oneself. The entire tenor of military life contributes to it. Thus, a cadet in an aviation school for fliers, who has been accustomed to living strictly according to regulations and who has begun to be proficient on a winged machine, wins a victory -- a victory over himself and over his fears and doubts, and learns to control his feelings in any situation. The instilling of deep ideological conviction, moral steadfastness, and an active vital position in a flier contributes to the successful formation of his high will qualities.

Aviation has always been on the forward edge of scientific and technological progress. Since the time of its birth, many generation of aircraft have been replaced. Modern flying equipment has fundamentally new aerodynamic arrangements which condition the features of piloting them. Thus, a flight in an airplane with its variable geometry wings at various angles is, figuratively speaking, a flight in different aircraft.

Aerial combat has also changed to some degree in accordance with the new equipment and weapons. It also places new demands on the dependability of a flier. And not only a battle. A normal flight in the stratosphere or at low altitude, vertical take-offs and landings on the deck of a ship, and flying as a group require a lot of mental strain and a considerable expenditure of moral and physical strength from a crew. Moreover, the air element often introduces adjustments and subjects the dependability of an aerial fighting man to a severe test.

The equipping of modern flying machines with various electronic systems and automatic navigational and aiming systems -- although it has simplified a flier's work in the air -- has not freed him from direct control and checking, especially during unexpected complications in the air. During the last 30 years, the number of different indicators and signal instruments in an airplane's cockpit has increased more than tenfold. There is a lot of different information and commands, to which one must react quickly, on board an airplane.

At the same time unfavorable factors, connected with altitude and speed, affect the crew. Therefore, they must use special protective equipment.

Under present conditions, how can flight reliability and safety be ensured? By the high quality of aviation equipment, comprehensive training of the crew, and correct organization of flights. However if some breaks are suddenly revealed in this system, a flier is obliged to foresee them in time, diagnose them, and quickly make intelligent decisions in accordance with the situation which has taken shape. This means that flight safety and its performance, as usual, are to a considerable degree in the flier's hands.

As is known, the surroundings exert not only a physical but also an emotional effect on an individual. This or that event evokes in one case strain, anger, despair, fear; in another -- satisfaction, happiness, delight. The factors called stresses negatively and sharply influence those who are little -- or completely not-- prepared in a psychological respect to overcome difficulties which arise during a flight.

In a trained and mentally stable flier an unexpected danger evokes a flood of strength and mobilizes him to overcome the danger -- in combat it mobilizes him to act resolutely. In such a state, an individual finds in himself hidden strength which he could not even suspect in a normal situation. It was also noted that mental strain is lowered during the repetition of a critical situation. In other words, a dangerous situation no longer unsettles a pilot's equilibrium -- he knows how to get out of it.

Automation is no panacea. Even the most completely automated systems on an aircraft must be controlled. This means that in the "man-airplane-surroundings" system the flier remains the indispensable link. He is the main person in the guaranteeing of flight reliability and safety.

As a rule, a flier's actions are not stereotyped. Every flight is different from the preceding one. Thus, the more complicated the assignment, the greater the probability of encountering unforeseen circumstances.

For example, a flier can feel lethargic during a flight, recall some unpleasantness, or become agitated -- and then all his programmed activity will go to pot. Therefore, a flier's dependability in the air is still determined by his ability to rid himself of earthly feelings completely and concentrate his attention on the piloting and combat employment of the aircraft.

Stress situations in the air are not such rare phenomena. Science is looking for ways and means which would contribute to their favorable outcome. Such things as increasing equipment reliability, creating automated systems, incorporating more improved life support systems and protection in an accident situation can relate to these.

High motives in military work have always been the basis for instilling in Soviet aviators a sense of duty, responsibility, discipline, purposefulness, self-control, and persistence in achieving assigned goal. The Great Patriotic War gave numerous examples of the unwavering loyalty of our fliers to the cause of the Communist Party and the Soviet people. Confidence in our victory was the source of the mass heroism of the homeland's defenders on the battlefields.

In the history of jet aviation there are also quite a few examples of fliers' courage and steadfastness. Thus, in a complicated emergency situation, Capt M. Kozlov did not lose self-control, acted correctly and intelligently, and saved expensive equipment.

Flying practice knows many cases of professional longevity lasting three-four decades. Fliers successfully flew in airplanes of the different generations and did not make mistakes leading to flight incidents. Perhaps, this is good luck? No. A thorough medical examination of these fliers; individual conversations with them; and a check of their work, life and way of life testify that all of them are noted for a high sense of duty and personal responsibility, careful preparation for a flight, creative understanding of progressive flying experience and deficiencies, and an indomitable striving to carry the honor and dignity of a Soviet flier on high.

However, can a flier nevertheless be mistaken? Obviously, just as any other individual, he is not insured against this. As practice shows, inaccuracies in piloting techniques are not excluded for a cadet or pilot during the initial stage of training or mastery of the flying program when knowledge is still not sufficiently deep. During this period, instructors and experienced methodologists plan and organize training with a smooth but continuous build-up of complexities in the assignments. They consider the negative effects of breaks in flights and of violations in the training sequence.

Unfortunately, when analyzing incorrect actions in the air, attention is often paid only to the last link in the cause and effect chain, that is, to the visible cause of the deviation and not to its source. As a result, shortcomings connected with the perception, opinion, solution, and motives of a flier's work when an emergency situation arises, often remain in the shadows. Only the correct consideration of the entire complex of mutually conditioned factors permits the deeper reason for mistakes to be determined and effective measures to prevent them in the future to be taken.

When climbing into the air, only that flier can count on success who -- along with a deep knowledge and firm skills -- has a strong will and is not subject to panic and fear. In this connection, it is important to remember that an individual has a large and powerful potential reserve of energy which is frequently displayed at a moment of danger even without consciousness.

Pilot V. Kunitsin, who had parachuted from a defective machine over the sea, found himself in a very complicated situation. Alone with the sea's elements in a tiny inflatable boat in the icy salty water, he did not fall into despair. Vladimir Kunitsin displayed character. He rowed warming himself. It was this way for two days. He emerged the winner.

High moral and combat qualities are instilled in Soviet fliers continuously and hourly during political, moral, psychological, and physical training, during special classes and flights, and during exercises in a situation which approximates a combat one as closely as possible. Of course, no one places the life of the aviators in danger when doing this. However, in order to imitate the picture of combat operations and evoke physical and moral strain, a definite tactical background, a shortage of time, and various obstacles are created. During this time, the psychology of the pilots and other crew members is subjected to the influence of different stresses.

Organizers of training combat work are trying to model a situation which would not only evoke sensations but also invariably ascertain flight and engineer technical personnel to overcoming indecisiveness, and form high emotional and will steadfastness and the ability to operate effectively under the most complicated circumstances.

Military work -- and more so flying work -- is a special labor. However, it is during strenuous training days in classrooms and at airfields, during training sessions, and in the air that the dependability of an aerial fighting man is born.

(Continued)

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AIR FORCES: ECONOMY OF FUEL, ENERGY STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 32-33

[Article by Engr Col Gen V. Skubilin: "Economize in the Sky and On the Ground"]

[Text] One of the most important tasks, which faces the Soviet people and on whose solution depends the further successes in fulfilling the plan for the final year of the 10th Five-Year Plan, is the rational use of material resources, the improvement of savings, and the elimination of losses in the national economy. The press, radio and television bring us each day information on significant extensions of the service life of machines and mechanisms and savings in energy and other resources. New output worth many hundreds of millions of rubles is being created from the raw materials which have been saved.

Aviators -- just as all fighting men in the armed forces -- are actively fighting to conserve state resources and materials and are treating the conversation of the modern combat complexes, which are located in the armament of units and subunits, carefully.

They have been created by the talent of Soviet scientists, the inspiration of designers and the selfless labor of engineers, workers and technicians; a great deal of national resources have been invested in them. Reared in the spirit of a careful attitude toward socialist property, aviator fighting men are operating combat equipment thriftily and waging a persistent battle to maintain airplanes and helicopters constantly ready for combat employment when solving complicated and critical tasks.

Rational operation and efficient use of aviation equipment depends on the purposeful and coordinated efforts of commanders, staffs, political workers, engineers, party and Komsomol organizations, the directors of flights and flight personnel, and specialists in the Air Force Engineer Service and supporting subunits. The employees of scientific research and testing organizations and of educational establishments can also help in a lot.

What are the basic avenues of this extremely important work?

The struggle for economic expenditure of aviation equipment resources is inseparably linked with improving the training process and bettering the organization of early, preliminary and preflight preparations; of servicing days; and of adjustment work. The instructional methods skill of commanders, their deputies, and engineers also plays a big role in this important task. Life convinces one that the better and more qualitatively exercises, classes, training sessions and training are prepared and the more fully progressive experience is used during their conduct; the less the aviation equipment resources expended.

Let us begin with our basic training form. More than once I have had occasion to observe how an aircraft with its engines running spends a long time at the technical position or the pre-take-off line awaiting permission to taxi to the take-off and landing strip. This happens when mistakes are made in planning, when the direction and control of flights are organized with insufficient accuracy, and when coordination between the flight director and the Air Force Engineer Service and vice-versa has been poorly set up. Sometimes foreign objects get into the engines because of poorly prepared taxi strips and runways and damage them. When there are intense group flights, the standing still of the aircraft leads to considerable overexpenditures of fuel and aviation equipment resources.

Or another question. A deviation by crews from the assigned route or a return to the airfield not at the calculated time forces those taxiing for the take-off to wait several extra minutes for their turn. Because of such an insignificant -- at first glance - violation of flight discipline, tons of aviation fuel are overexpended in a regiment during one flight shift alone.

As is known, the expenditure of fuel during a flight essentially depends on the load of the flying equipment. This is understandable. The greater the flying mass of an airplane or helicopter, the higher are the required engine operating conditions to guarantee the assigned flight conditions. The majority of military-type airplanes and helicopters at the present time take off with the fuel system completely filled. The requirements of combat readiness and the unexpectedness of flights dictate this. At the same time, in military transport aviation, the fueling of an aircraft varies within rather broad limits depending on the mass of the cargo being transported and the calculated flight distance. In this regard, extremely tangible reserves for saving fuel by rationally loading it in strict accordance with the engineer and navigation calculations, considering the specific conditions, exist.

For example, when increasing the flight mass of an IL-76 aircraft by five tons because of fueling above that required for the given assignment, about 150 kilograms of extra fuel are expended during one hour of flight. In addition, more than 500 extra kilograms of fuel are expended for the selection of the assigned altitude in this case.

Recently, training flights in some long range and front aviation aircraft have taken place with the fuel system not completely filled. This provides quite a bit of savings in fuel. Careful engineer and navigational calculations, and a careful check of the fueling of the machines before take-off and its expenditure directly in the air ensure the safety of these flights.

Important elements in the organization of flights in all branches of aviation are: the selection of altitudes for long trips at which the expenditure of fuel is minimal, and the accurate observance of the calculated operating conditions. A premature descent to lower altitudes increases fuel expenditures. For example, a change in flight altitude from 10,000 to 9,000 meters gives an expenditure of about 300 extra kilograms per hour for an IL-76 airplane.

One of the basic signs of the rational organization of flights is the correct determination of the amount of aviation equipment needed. It is very important to select for the flight shift that amount of aircraft (helicopters) which will provide the maximum flying and advancement of fliers according to the combat training program. The judicious combining of individual exercises with the maximum duration of flight for that type of flying equipment plays a decisive role here. Thanks to this, substantial savings in fuel -- without damaging combat readiness, flight safety and the crews' combat training -- are achieved. Incidently, the ability to expend fuel thriftily and glide and engine resources must be regarded as an integral element of a crew's flying skill.

For example, the selection and maintenance of a rational flight mode depend on the crew. On a long flight, it is necessary to make skilful use of a change in the profile based on the depletion of fuel and the decrease in the aircraft's flight mass or to select the most advantageous speed for the given altitude with the least kilometer expenditure. Thus, when increasing the flight speed of an IL-76 aircraft by 10 kilometers per hour above the most advantageous one, about 300 extra kilograms of fuel are expended per hour.

Quite a large amount of fuel can be saved when climbing to altitude after take-off and when descending for the landing approach. If the flight mission and air situation does not limit the time to climb to altitude, it is not advisable to use uneconomic afterburner or maximum and take-off engine operating conditions. For example, in military transport aircraft of the AN-12 type, it is advisable to descend-- having throttled back the engines -- to 4-5 kilometers with a vertical speed of 10 - 12 meters per second and then decrease it to 6-8 meters per second for correct movement along the glide path. This method of descending from high altitudes permits the advantages of flight modes to be more fully used with a minimum expenditure of fuel. When selecting the most advantageous engine operating conditions for all stages of a flight, it is necessary to consider the flight mass of the aircraft, the condition of the air surroundings,and the speed and direction of the wind.

After making a landing, it is necessary to use the wheel brakes judiciously, keeping in mind the quick freeing of the landing strip with a minimum expenditure of fuel. On aircraft with braking parachutes, one must strictly observe the recommendations for their release. When the parachute is let out prematurely, the more so with a head wind, a plane can be halted in the middle of the landing strip, and until the braking parachute is released, will move at increased engine operating conditions, that is, with an overexpenditure of fuel.

Quite a bit of reserves for saving fuel lie in piloting and air navigation techniques. Let us admit that it is possible to gain several seconds by carefully calculated and accurately carried out turns. When making a landing approach according to the prescribed schedule, the timely lowering of the undercarriage and flaps and the correct maintenance of speed contribute to increasing savings. When flying along a route, some fliers and navigators allow deviations from the assigned route parameters, as a result of which the direction of a flight is foolishly increased and too much fuel is expended.

It is impossible to justify gross errors in the organization of flights where a crew, in order to make a landing with the calculated landing mass, is forced to deplete fuel premeditatedly in a circle, or what is even worse to let out the brake flaps and turn on the afterburner. In this case, the expensive fuel literally flies out into the wind. However, landing with a large (close to the extreme) mass is often done more roughly than with a normal one. This can lead to break-downs in the aviation equipment, for example, to breaking the tightness of the fuel lines. In order to avoid this, it is necessary to plan and calculate the assignment very carefully.

In considering the most advantageous engine operating conditions an effective method for reducing fuel expenditures during a flight, one must not forget an important detail. The fact of the matter is that the amount of fuel depleted by an engine is equivalent to the work performed by it. This in its turn determines the totality of the thermodynamic loads on the engine assemblies and parts. Therefore, the use of rational engine operating conditions not only permits fuel to be saved but also contributes to decreasing the calorific intensity of the power-plants, that is, to increasing their operating reliability and longevity.

(Conclusion follows)

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AIR FORCES: INTRODUCTION OF MAINTENANCE SCHEDULE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 p 34

[Article by Maj A. Petrov: "For a Common Rhythm"]

[Text] It was animated in the technical building of the 1st Squadron. The chiefs of the servicing groups and the aircraft technicians had cleared up the sequence for the preliminary preparation of the fighter-bombers for flights and the arrangement of them in the shelters, and they had firmed up the composition of the teams and the nature of the preventive measures. The planning table -- the document which defines the content and procedure for conducting the preliminary preparation of aviation equipment in a subunit -- served as the primary source of information for them. The inspections of the aircraft by the squadron's leading element and the work connected with the replacement of units and protracted parking, etc., were strictly defined in it according to time. Several minutes were sufficient for each officer to familiarize himself with the scope of the coming operations, assign a task to subordinates, and begin working in an organized way.

In the squadron where Maj Tech Serv R. Lyashenko heads the Air Force Engineer Service, they did not get used to the planning table right away. Although the flight's technical maintenance unit and the servicing groups, -- yes and the aircraft technicians -- regarded it with the necessary attention, they respected the former plans for each aircraft or type of weapon. They carried them out on their own over the course of the work day.

Not half bad. However, were these plans always carried out?

"Not always," Officer Lyashenko said frankly, and he cited several examples where the routes of the specialists in the servicing groups intersected at one aircraft. "At such times you could not force your way into the cockpit. The electricians, instrument technicians, and radiomen need to get to it. It was not so easy to find a way out. As a result time was lost and the quality of the work was lowered."

The deputy squadron commander for the Air Force Engineer Service cited another fact. Because of the disconnected plans, the preliminary preparation on many planes was often dragged out, and the main work was performed during the second half of the day in a hurry. Some specialists had become accustomed to these phenomena, thinking that the costs in work were unavoidable. They considered the preliminary preparation planning table a temporary experiment.

However, officer Lyashenko found ardent allies for the innovation in the persons of V. Kolesnik and N. Vlasov, chiefs of the flights' technical maintenance unit; V. Balyabin, the chief of a group; and A. Chikin, the technician of an excellent aircraft. Having familiarized themselves with the rules for compiling a planning table, they came forward as the initiators of its introduction. On the eve of a scheduled preliminary preparation, the officer carefully filled out the graphs, and determined the scope of the work, the time and the sequence for performing it for each airplane. Everything seemingly appeared well on paper.

The first day of work using the planning tool began. When the technical element arrived at the hardstand, Major Lyashenko reminded all the specialists about the planned operations, order of movement of the groups, and use of the servicing equipmnet; and answered the numerous questions in detail. After the instructions, the aviators were sent to the airplanes. The preliminary preparation began.

Before dinner, everything went correctly. The specialists confined themselves exactly to the schedule for inspecting the winged machines and eliminated breakdowns rapidly. There was no "congestion" of groups at a single one of the fighter-bombers being inspected. Each group serviced the planned aircraft at the prescribed time. This then was typical. After four hours of strenuous work, the aviators had managed to prepare two machines more than during the last preliminary preparation. From the point of view of combat readiness, this had quite a bit of significance.

Time and equipment were used effectively. Knowing what time and which group would service their airplanes, they were able to organize their work accurately, and control the actions of the specialists better. How was it before? An aircraft technician would have just began an inspection of the machine or survey of an assembly, and the mechanics from some group or other would appear at the airplane. The officer automatically left off the work he had begun and exercised control as the guidance documents require. Another time, circumstances came together so that the aircraft technician had to act this way many times.

Nevertheless, everything did not go well the first day. The aviation equipment group exceeded the time for preparing the last two planes. The weapons personnel did not manage to carry out the special purpose inspection on a machine which had come from the technical maintenance unit. There were other discrepancies also. Some of the officers hurried to call the experiment a failure. "There is little benefit from our planning table. Only extra trouble." However, Maj N. Lyashenko was inclined to be optimistic.

His confidence was transmitted to the others. The reasons for the discrepancies were quickly determined in the squadron, and specific measures were planned to eliminate them. In particular, teams which could service aircraft on their own were formed among the numerous groups which were completely outfitted with specialists. For example, the aviation equipment group now moved in two directions, naturally this lessened the time for the inspections. The specialists also made adjustments in the norms prescribed for the performance of this or that test. Of course, all this complicated the drawing up of a planning table, but in return the preliminary preparation process became more organized and flexible.

Here is proof of this. When inspecting his fighter - bomber, Lt Yu.Korzhitskiy detected a seal failure in a reduction valve in the de-icer system. It was necessary to replace the valve. Sr Lt V. Kolesnik, the chief of the flight's technical maintenance unit, having found out about the trouble, immediately turned to the planning table. He was trying to find out how to put the aircraft back into operation quickly without disrupting the rhythm of the specialists' work. The task was complicated by the fact that the defective valve was located in the cockpit. The technician needed no less than an hour to replace it. The table helped Kolesnik to find this hour. The chief of the technical maintenance unit team said to Lieutenant Korshitskiy: "Let us begin work in ten minutes, right after the radiomen. We will completely manage before the arrival of the next group."

The estimate proved correct. When the instrument specialists and electricians got to the airplane, the cockpit was already free.

In the squadron, the preliminary preparation planning table contributes to the rational planning of special purpose inspections and servicing days. At the end of each day, the specialists insert on it the most typical and dangerous breakdowns detected on the aircraft and indicate their causes. In the headquarters, the regiment's engineers analyze the troubles, group them, plan specific preventive measures,and issue the necessary recommendations and instructions to the maintenance personnel. Today, based on the analysis conducted, special purpose inspections of the fuel and de-icing systems have been included in the preliminary preparation planning table.

Soon, everyone was convinced that accurate planning of the preparation of aviation equipment for flights on the scale of a squadron is an important and necessary task. The new method permits the required frontage of work to be accurately and fully provided for, the work of each specialist to be organized on a scientific basis, and work time to be used with the greatest productivity. It must be especially emphasized that in doing this the quality in servicing the aircraft pool and its combat readiness are increased significantly.

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AIR FORCES: PREPARATION OF SPECIALISTS FOR EXAM DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 p 35

[Article by Eng-Maj V. Doktorov: "A Sharp Question"]

[Text] The Air Force Engineer Service specialists were assiduously preparing for the ratings tests. They read the necessary literature once again, they looked at the notes in their conspects, they consulted the experienced engineers and they studied additionally the servicing of the most complicated systems and automatic mechanisms.

You see, an examination for a higher rating is a check not only of theoretical knowledge but also of the ability to use it intelligently when servicing aviation equipment, observe the requirements of the appropriate documents strictly, and investigate on their own this or that trouble using modern checking and testing equipment and other control systems.

Our engineers are constantly concerned about the growth in the number of highly rated specialists. The question of organizing their training is regularly discussed in the unit's instructional methods council and during assemblies of the deputy squadron commanders for the Air Force Engineer Service and the chiefs of groups and the flight's technical maintenance unit. The requirements of the guidance documents for preparing the technical staff and for procedures for mastering (confirming) a rated qualification are at the basis of all this work. It was decided to use the so-called step-by-step method of training and forming skills. Its essence consists of the following. A schedule is drawn up for each aviation specialist in the subunits. Specific topics, the periods for studying them, and information on taking the examinations are defined in it in exact accordance with the guidance documents.

What is new here? Formerly, the rating program was determined for all Air Force Engineer Service personnel for the entire training period and the taking of the examinations was conducted at the end of it. Now, the approach is a differentiated one. Each specialist is personally required to give an account of himself to his leader in accordance with the existing schedule and to take the examinations at the prescribed time.

It is necessary to point out that the engineers have also placed the questions on the cards in a differentiated manner, with a different degree of complexity. Thus, a thorough knowledge of their functional duties and safety measures and the ability to direct junior specialists are required of young technicians, the recent graduates of military aviation schools. Requirements are higher for those who are confirming the title of "master" or "first class". The examiners do not spare sharp questions, which are not easy to answer. Here, not only a thorough theoretical knowledge but also excellent skills and the ability to work harmoniously with other specialists are needed.

Sr Lt Tech Serv A. Tivikov managed the task successfully. Despite a comparatively short period of service, he has already acquired experience in servicing the fighter-bombers. As the best specialist, he has been transferred to the technical maintenance unit of the regiment. He freely orients himself in the kinematics of the elements of the radio technical system for measuring the drift angle speed and of the inertial course system. Based on an analysis of the equipment's condition, the officer has substantiated recommendations for the preventive inspection of a number of deficiencies.

Capts Tech Serv A. Dribas, N. Krupin and Ye. Kadach; Sr Lts Tech Serv A. Povarkov, A. Knak R. Amirov, and S. Danilov; and many others are demonstrating a thorough knowledge of the equipment and the rules for servicing it. It is no accident that in our unit almost every third specialist now has a firstclass or master rating, and 50 percent of the Air Force Engineer Service personnel possess an allied specialty. Seventy percent of the fighter-bombers bear the name "excellent unit airplane."

These successes did not come by themselves. They are the result of the skilfully planned and correctly organized technical training of the Air Force Engineer Service personnel. Our engineers are devoting a lot of time to the experienced specialists also. In doing this, two goals are being followed: to train them to continuously maintain their skill at a high level and to make them active helpers of the squadron's Air Force Engineer Service leaders in organizing the training process with the personnel.

Each of our technicians with a high rating receive for independent study four-five rather complex topics on which he then gives a periodic accounting of himself. However -- as experience testifies -- the need to refresh knowledge sometimes arises. Then, the deputy commander for the Air Force Engineer Service assigns the following task to the specialists having a master's rating: On any day (in the event of a break in flying because of unfavorable weather conditions) be ready to present papers to the subunit's Air Force Engineer Service personnel. These classes help the aviators to deepen their knowledge. You see, during the presentations or after them, a discussion of question on servicing this or that system often takes place. Usually the director of the classes offers an opportunity to speak to as many specialists as possible. This increases the activity of the engineer and technical staff and its responsibility for theoretical training.

It is necessary to mention that during such classes the engineers strictly consider the category of specialists, their ratings, their experience, and even their psychological qualities during the discussion of the topics. Practice has shown that by asking questions which are too complicated for the young specialists -- for example, about working on the automatic fuel mechanisms, it is possible to unsettle them. They will be allowed to engage in regulating the more critical units somewhat later when the Air Force Engineer Service leaders are convinced that the youth have mastered the simpler subjects perfectly.

Therefore, when working, for example, with Lt Tech Serv N. Zhuravkov, the leaders direct their attention mainly to the placement of systems and ways to inspect them during ground preparation. They explain the physical processes which take place in the systems and the meaning of the adjustments.

It is suggested that specialists firstclass or masters answer the same questions but with a more solid substantiation and with detailed computations. The leader can also organize an exchange of experience on methods for training a specialist on a specific question. As a rule, such classes give good effect and bring mutual benefit to both the young and experienced people.

We persistently recommend that the young fliers not feel shy but turn to the experienced specialists for advice and help.

Once, when inspecting a fighter bomber, I asked Lt Tech Serv A. Sinitsyn several questions. On the whole, he answered them intelligently. Nevertheless, I noted that his knowledge of the arrangement of several units and systems and their functioning was not sufficient.

Of course, both I and the young technician's chief would have been able to remind him of the necessary information. However, we thought that it would be wiser and more useful if one of the highly qualified specialists in the group did this. He did this tactfully, in a comradely way. The benevolent discussion had a positive effect on the young technician. He began to work more persistently at raising his knowledge and started to take a continuous interest in questionson servicing a fighter-bomber.

There have been cases when, having detected trouble on an aircraft or after a pilot's comment, a specialist hurries to inform the deputy commander for the Air Force Engineer Service or an engineer about it. However, when he is asked: What do you yourself think about the cause of the comment, where do you plan to look for the trouble, how many mechanics will you need for this, what checking and testing equipment, the young officer becomes flustered and sometimes frankly confesses that he is not ready for such questions. It was necessary to convince the specialist that initiative must come first of all from himself.

As a result of this sound work, the youth have begun to treat the improvement of their knowledge and the strengthening of their skills more attentively. The young specialists have drawn noticeably close to the line where not a single sharp question will catch them off guard.

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AIR FORCES: PROPER CONNECTION OF EQUIPMENT EMPHASIZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 p 36

[Article by Engr-Maj Ye. Krivoruchenko and Engr-Capt Ye. Lobanov, candidate of technical science: "Hot on the Track"]

[Text] The servicing of modern aviation equipment requires thorough knowledge, firm skills, and error-free actions from personnel. The failure to consider these requirements often turns into trouble for specialists. An analysis shows that in order to prevent mistakes it is necessary to conduct organizational and technological measures -- as they say -- "hot on the heels" and improve work standards.

In some subunits, cases of incorrect connection of plug connectors, high frequency cables, and individual wires due to the sameness of the joining elements (they do not have clearly expressed distinguishing signs) and their close mutual location still occur. The inattention of the specialists when performing work leads to mistakes. Therefore, it is necessary to plot or renew their markings before uncoupling these connector elements and before dismantling units (assemblies).

Mistakes, connected with the incorrect placement (assembly) of units (assemblies), the parts in them, and different connecting elements, are sometimes encountered. This is explained by the fact that the units often have an identical external appearance, dimensions, and mounting places. Changing the positions of units and assemblies, which perform the role of sensors and output regulators in the systems for contolling the flying equipment or engine or for navigation, is especially undesirable. Therefore, before disassembly it is necessary to mark similar type units with markings, for example, "left", "right", "front", "rear", "upper", and "lower", and plot the appropriate markings which eliminate the placing of assemblies in flying equipment reversed 180°. Only after performing all the preliminary measures is it possible to begin work.

In the majority of cases, mistakes are the result of the careless or inattentive attitude of junior specialists toward aviation equipment and of violations of the requirements in the servicing instructions. In order to justify themselves, some aviators at times cite the awkward approach to the individual units, the shading of the access to the regulating points or places being inspected by other equipment, and the use of an unprovided for instrument. However, specialists, who possess high standards, perform any operation under the most difficult of circumstances with excellent quality, and always reveal the shortcomings committed by others earlier.

... The preflight preparation of the planes for flying was taking place. The senior electrical equipment mechanic in the servicing group was inspecting and testing the equipment in the cockpit. Having completed the operation and having shut off the ground power source, he reported the good working order of the electrical equipment. Sr Lt Tech Serv V. Myakota, the chief of the servicing group, made a second inspection, and then switched on the storage battery under a load. It was revealed that its voltage was lower than that required for the technical conditions.

As it later turned out, the reason for the decrease in the storage battery's voltage was its discharge during the inspection of the equipment. The specialist had incorrectly connected the bunch of electrical wires of the ground power supply to the side of the plane. This led to the breaking of the contact in the plug connector and the rupturing of the electrical network. The senior mechanic had not detected in a timely fashion the decrease in the voltage using the on-board voltimeter and the signal on the instrument panel, but had continued the inspection with the ground power source actually turned off. This led to the discharge of the battery. It was only thanks to the correctly organised operations of the operation-by-operation check and the punctualness of officer V. Myakota, the chief of the servicing group, that more serious troubles were averted.

One of the mistakes made by inexperienced technicians and mechanics is the incorrect joining of the connections in the fuel, hydraulic, air, and oxygen systems and the air pressure duct. This mistake is one of the more dangerous and can lead to flight incidents. Its cause is carelessness in organizing assembly operations. This is completely intolerable.

No less substantial are the mistakes connected with the overtightening or undertightening of nuts on bolt joints and with damage to the threads. Service and technical documentation provides for the use of a calibration instrument for the more critical operations. If such tightening is not provided for, one must not exert excessive effort. The bolt (nut) is considered to be tightened normally when -- after the spring washer is fully compressed -- it is tightened another quarter turn.

When fastening current-carrying bus bars, it is necessary to remember that both excessive and insufficient tightening of the terminal bolts can be the cause of a breakdown. When current passes through the contact connection, the bus bars heat up but the coupling bolts, through which current practically does not pass, remains at the original temperature. As a consequence of this, with the length of the bolts remaining unchanged, the thickness of the heated bus bars increases and the pressure of the bolt head on the surface of the bus bar grows quite a bit. As a result the head can cut into the bus bar. After this connection has cooled, the contact pressure becomes less than it was before the passage of the electrical current. This can lead to overheating and welding of the contact connection; insufficient tightening can lead to unwinding of the nut by itself and the same consequences that heppen with excessive pressure.

Experience testifies that the quality of preparing aviation equipment for flights and the regulating and repair operations performed during it is best of all revealed during operation - by-operation checking.

A reliable method for preventing mistakes is the systematic analysis of their causes during classes. In this regard, Engr-Maj V. Sapurin is setting the example. He is devoting a lot of attention to the organization and conduct of class and group lessons, seminars, and training sessions. In the tracks of the shortcomings revealed in the work on the equipment, the engineer carefully controls and directs the independent work of the technicians and mechanics and thoughtfully trains them in a differentiated manner with a consideration for their level of training, functional duties,and peculiarities in the servicing of the equipment. All this has a tangible effect. The subunit has flown for a long time without an accident and solves assigned combat training tasks successfully. There are many collectives like this. It is necessary to study more thoroughly their experiences in training and competition and their methods for finding and preventing break-downs in aviation equipment and raising its reliability, and to disseminate everything that is progressive among the aviators.

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AIR FORCES: WORK OF RATIONALIZERS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 p 37

[Article by Engr-Maj V. Cherkay: "The Rationalizers Said a Word"]

[Text] This was why the specialists in the electrical equipment group were annoyed. Having removed the storage batteries from the machine, the mechanics detected signs of electrolyte inside the container. As is known, the insulation of the power cord decreases when electrolyte accumulates. In order to remove the electrolyte and restore the necessary insulation resistance, no less than four man-hours are required for one container alone.

After carrying out the technical operations, one of the mechanics said angrily: "Is it really impossible to avoid this phenomenon?"

Another answered him: "It is difficult. You see, the electrolyte vapor condenses, and no matter what you do it will fall on the electrical power cord on the container bottom. One can hardly manage to protect it."

However, Sr Lt Tech Serv L. Dubrovin had another opinion on this score. For a long time, he thought about how to prevent the electrolyte from falling to the bottom of the container. He consulted with the engineers and read technical descriptions. As a result, he came to the conclusion that it was necessary to change the packing of the power cord. The officer worked out a scheme which prevented electrolyte from falling into the container and accumulating there. This rationalizer proposal permitted the longevity of storage battery container performance to be increased.

Another specialist in the aviation equipment service -- WO [Praporshchik] A. Khrustalev -- introduced a rationalizer proposal which also contributed to prolonging the service life of containers. The fact is that the guide runners often become deformed during repeated transport of the batteries. When aligning them, the rivets are torn away, the covering is pulled out, and cracks are formed in the runners. The device, made by Warrant Officer Khrustalev, permits the runners to be evened quickly and -- what is the main thing -- reliably. It is handy and simple to operate.

We have many examples of a creative approach to the problems facing aviation specialists. The innovators, in improving the ways and means for raising subunit combat readiness and ensuring flight safety, are concerned about the care of combat equipment and weapons and the saving of fuel and other valuable materials.

In particular, special trainers for the technicians and mechanics have been subordinated to this goal. On them, the young specialists develop skills in disassembly and assembly work and in replacing filters, gaskets and other items. Classes on such trainers help them to avoid waste in their work and prevent the disabling of aviation items.

Take, for example, the trainer made by the technical maintenance unit specialists. It permits lubrication system, engine, and hydraulic system filters to be removed and replaced in a practical way, oil to be filled, the tightness of fastening bolts to be checked, and many other technical operations to be carried out.

It is gratifying to note that the trainer seldom stands idle. The deputy squadron commanders for the Air Force Engineer Service and the chiefs of servicing groups organize classes here not only with recent graduates of military schools but also with experienced specialists. You see, aviation equipment breaks down comparatively rarely and consequently, the skills of Air Force Engineer Service personnel can be lost with time. The trainer helps to maintain them.

In order to ensure the normal operation of the power plant on aviation equipment which we are servicing, it is necessary to remove the fuel sediment before starting. When carrying out this operation, a certain amount of fuel is poured out on the ground from the separating tank and falls on the fuselage. A little of it falls, but technicians, having calculated the amount of fuel during the flights for each machine, receive a very sizeable number.

The problem of conserving POL has interested the rationalisers. One of them, Maj N. Tolpegin, has worked out and introduced a simple device in the form of an adapter with a hose. It has helped to eliminate fuel losses when removing the sediment. Another officer developed Major Tolpegin's idea -- he suggested also placing a pressure valve for pouring the sediment not only from the main tanks but also the wing ones.

Officer M. Turkin, a rationaliser, also busied himself with questions on decreasing fuel losses. He made a protective hood which is put on the fueling nozzle of the refueller. This prevents moisture and snow from falling into the tank. In addition, an extension, which permits fueling time to be lessened by 20-30 percent and prevents fuel from being kicked out, has been attached to the fuel nozzle.

We have achieved savings not only in fuel but also in lubricants. Here is one example. During adjustment operations, lubricant is kicked out during the squeezing of the landing carriage's shock struts. WO V. Yavkin proposed attaching to the body of the strut--instead of a charging pipe connection -- a different one with a hose lowered into the container. As a result, they managed not only to prevent losses of lubricant but also to raise the standards in the work of the specialists.

The aviator craftsmen are also improving work tools. Let us return to those same landing carriage shock struts. When disassembling the charging pipe, the nut fastening it is unscrewed with a normal standard wrench. In doing this, there are often cases when the threads of the pipe connection are torn. The same picture is seen when replacing oil seal collars on the engine's assemblies. Lt Tech Serv O. Altukhov and WO's I. Fomin and M. LeBedev made a special wrench which helped the technicians and mechanics to avert breakages in items and the damaging of the seals.

The rationalizers in our unit are making a worthy contribution to raising the combat readiness of aviation subunits, to improving the training material base, and to improving the servicing and care of aviation equipment.

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AIR FORCES: PROPER MAINTENANCE OF AIRCRAFT DESCRIBED

Moscow AVIATSIY I KOSMONAVTIKA in Russian No 5, 1980 pp 40-41

[Article by Maj Gen Avn V. Korotokov, military pilot firstclass: "A Servicing Day's Reserves"]

[Text] Within the system of measures whose main goal is the further improvement of aerial training, of the combat readiness of crews and subunits, and of flight safety, a big role belongs to servicing days. They are conducted in units on a strict periodic basis at the times prescribed by guidance documents. If initiative and searching lie at the basis of their organization and of the performance of the operations provided for, then servicing days become an important reserve for a growth in the training of personnel, including flight personnel, for broadening their technical outlook, and for strengthening special skills.

A servicing day is almost always planned on a regimental scale. The work is organized by the commander. However, does this mean that the other chiefs, in particular the squadron and flight commanders, are obliged to be simply executors of the will and instructions of senior personnel? Of course not. Getting things done and punctuality are of course important. However, officers must have their own plans which have been developed on the basis of the general one. A creative approach is also needed in their compilation and execution. Otherwise, one cannot talk about any serious return from a servicing day -- we will talk about flight personnel. Life provides convincing confirmation of this.

The servicing day was ending in the regiment. The personnel of the Air Force Engineer Service were acting in an organized manner. On some planes, a rather complicated and labor-consuming special purpose inspection had been carried out; on others -- the planned operations. The fliers, technicians and mechanics had undergone training. It seemed that everything was going as planned; nothing evoked the concern of the officer leaders.

However, at the end of the day the deputy unit commander for the Air Force Engineer Service decided to check the state of affairs in the subunits. It was required that the material for the critique, the summing up of the work, and the determination of socialist competition winners be firmed up. Then, he had occasion to live through several unpleasant minutes. For example, it turned out that the fliers in the flight, which Capt Yu. Kozhushkin, a military pilot firstclass, commands, had poorly mastered the questions pertaining to the subject of the training session which had just been conducted. In the adjacent flight, the planned series of actions by the personnel upon the "assembly" signal had not been worked on.

The deficiencies were eliminated there and then. A reserve of time had been provided in the plan for this. A serious reprimand was given to the guilty ones. However, it was necessary to investigate why such derelictions had become possible.

To put it briefly, in the first case the reason for them was Captain Kozhushkin's formal attitude toward the realization of what had been planned. The officer had a good plan for the training session on a pressing subject. However, when it came down to the job, the commander decided for some reason that his subordinates had known all this for a long time and were capable of acting quickly and intelligently. The inspection showed the reverse.

In the second flight, the deficiency arose as the result of the commander's and the technical maintenance unit chief's lack of organization. Before the servicing day, they had commented on the poor order in the places where the subunit's planes were parked. In order to correct it, the officers borrowed part of the time which was provided for working on combat readiness questions.

The derelictions of the flight commanders did not involve serious negative consequences that day. However, it is easy to understand that everything could take a turn in the opposite direction if responsible personnel lessen their control over the actions of subordinates for some reason. In this connection, the following bygone incident is recalled.

The flight personnel of the squadron, where Lt P. Malyshkin served, were practicing intercepts and air combat with planes which went to altitudes close to the practical ceiling of the fighter aircraft.. At the height of the shift, the news that two aerial fighting men were unable to carry out the planned exercise grieved everyone. In addition, both had violated established safety measures. It caused one to prick up one's ears that these pilots were from the same flight.

Their flying was carefully analyzed using the information from the objective control systems. The objective control system material and an interrogation of the young officers provided an opportunity to simply establish that the gross errors arose because of the fliers' poor skills in working the controls for the fighter's weapons. Meanwhile, this had been practiced during a training session which had been held on a servicing day which had been conducted not long before the flights. However, the flight commander had organized it poorly and did not use it to increase his subordinates' training.

In justifying himself, the officer said that he thought to make up for what had been neglected immediately before the flight -- during the preliminary preparations. However, he was not able to do this for a number of reasons. Although the young fliers underwent a check and received permission to perform the assignments, the latter turned out to be beyond their capabilities.

The examples which have been discussed are undoubtedly not typical of military life. Rather, they are annoying exceptions. I know many flight commanders who completely use the reserves of a servicing day to improve the personnel's knowledge and skills.

Capt Ye. Burenin, Sr Lt V. Pokusayev, and others approach the organization of a servicing day and its conduct creatively and with initiative. For example, the night before, military pilot secondclass Pokusayev and the chief of the flight's technical maintenance unit, Sr Lt Tech Serv P. Chernyavskiy, drew up a plan which was brief but which completely embraced the operations and classes which had been provided for, and made detailed calculations of the time allotted for them.

Here is what is typical. During planning, the officers primarily proceed from the tasks assigned by the regimental and squadron commander element. However, at the same time, they introduced additions which make these tasks more concrete and which consider what is only necessary for the flight. The personnel are arranged accordingly and it is pointed out who will help whom in what and when; that is, everything is provided for so that what has been planned will -- without fail -- be carried out fully and with high quality by the end of the servicing day.

What does the creativity of Senior Lieutenant Pokusayev consist of? For example, he has a long range theme for the study of the aviation equipment and for the training sessions on it. This permits specialized knowledge to be systematically and purposefully expanded and deepened and the fliers' skills to be strengthened. When preparing for a servicing day, officer Pokusayev -- where possible -- selects for a class those question whose solution will not only contribute to high quality performance of the scheduled exercises by flight personnel but also make the work of the technicians and mechanics easier.

The flight was faced with bombing targets at the range and destroying them with rockets and cannon fire. The fliers conducted an effective training session on operating the weapon controls in the cockpit. However, Pokusayev did not limit himself to this.

The fighters had to take off with almost a full combat load. In carrying out the instructions of the deputy squadron commander for the Air Force Engineer Service, the chief of the flight's technical maintenance unit decided to check the pressure in the landing gears shock struts. Officer Pokusayev saw to it that not only the technicians and mechanics but also the fliers observed the work of Senior Lieutenant Technical Services Chernyavskiy. Chernyavskiy accompanied his actions with a detailed narration. As a result, a common method for carrying out similar operations was developed, and flight personnel strengthened their knowledge of the construction and operating principles of the units and mechanisms in the landing gear.

I recall another time when a special purpose inspection of the high-altitude equipment of a missile carrier was taking place. The flight was faced with flying in the stratosphere. The commander did not let a moment escape in improving the training of the subordinate fliers. The training under the direction of the chief of the aviation equipment servicing group turned out to be extremely useful.

In a word, both theoretical training and training sessions and inspections are planned during servicing days by Senior Lieutenant Pokusayev, and they are invariably conducted with a consideration for the complexity of the tasks assigned for the near future, the peculiarities in servicing aviation equipment, the level of the fliers training, and the mistakes that they have made in working with the fixtures in the cockpit. The plan for organizing the servicing day is approved without fail by the squadron commander. Special attention in the list of operations is always paid to an inspection of systems, assemblies and instruments where defects had been detected earlier.

Here, I would like to make a small digression. Practice testifies that the results of the flight personnel's work are improved if classes and tutorials on the aircraft (helicopter), engine, equipment systems, and weapons are conducted before the servicing day. Then, inspections of the equipment are more purposeful and it's as if the fliers study it as a complex again.

Having received the task for a servicing day from the commander, Senior Lieutenant Pokusayev sets off with the men for the hardstand. Without fail, he listens to a report from the flight's technical maintenance unit chief on the condition of the aviation equipment. Then, he gives instructions to his subordinates, firms up the agenda and list of mandatory operations on the fighters, and announces the theme and periods of the classes (training sessions) with the fliers and the time and place for the technical critique. It is necessary to point out that some flight commanders do not devote sufficient attention to organizational questions, transferring all trust to technical maintenance unit chiefs. It seems that they are acting incorrectly. The obliteration of personal responsibility without a doubt damages the men's training. Officer Pokusayev never permits this. Senior Lieutenant Technical Services Chernyavskiy receives word to detail the tasks only after the commander has said everything that he considers necessary.

While the crews headed by the pilots are engaged in inspecting the fighters and eliminating the defects which have been found, Senior Lieutenant Pokusayev works with his crew, and the flight's technical maintenance chief helps those who need it. At the same time, the officers check on the aviators' actions and watch for the exact observance of the schedule.

The flight, where Senior Lieutenant Pokusayev is the commander, is a young, harmonious, and united collective. Here, the fliers eagerly help the technical staff in its difficult work. This cohesion has a positive effect on service and on general training results. It is easy to understand that in performing operations within their capabilities, flight personnel strengthen theoretical knowledge in practice and expand their personal professional outlook.

Classes or training sessions on the planned theme are conducted at the time prescribed by the squadron commander. It has already been pointed out that the chiefs of the flight's technical maintenance unit and the aviation equipment servicing group direct the training sessions. However, the deputy squadron commander for the Air Force Engineer Service, the flight commander himself, and at times the unit's engineers in various specialties can also act in this role. Just recently, the fliers developed a work and coordination procedure for the start-up and testing of an engine before a flight, the checking of weapons, and for starting up an engine in the air; worked up rules for using the controls for the fighter's weapons when employing them under different conditions; and other subjects. Senior Lieutenant Pokusayev has expended quite a bit of effort and energy so that each training session is an efficient and effective way to form high professional moral and psychological qualities in the fliers; and instil faith in the outstanding capabilities of the aircraft being serviced. When Pokusayev directs a training session himself, he places the fliers by means of inputs in different non-standard situations which require intelligent, rapid and decisive actions. If Air Force Engineer Service officials are conducting the training session, he always informs them about the questions and operations to which the greatest attention must be paid when training this or that flier.

Once, the flight had to participate in a flying tactical exercise. Landing on other airfields was not ruled out. Senior Lieutenant Pokusayev entrusted the technical maintenance unit chief with once again reminding the aerial fighting men about what must be done how when preparing the fighters on their own for the second flight. Then, the fliers trained on this. The skills acquired proved useful during the exercise.

On a servicing day, officer Pokusayev's subordinates always put things in order at the hardstands of the aircraft. The fliers inspect the shelters and firefighting equipment. They concern themselves with the cleanliness of the flight's area and the taxi-strips.

Work is ended with a technical critique. As a rule, it is conducted in an instructive manner. The flight commander and chief of the technical maintenance unit skilfully use the material, accumulated during the day, in evaluating the actions of the aviators and in determining the winners in socialist competition. If it is required, Senior Lieutenant Pokusayev resorts to diagrams, placards, and information from the objective control systems to improve the authenticity of his conclusions. He singles out the best people, investigates mistakes, and sets the times for eliminating them.

Officer Pokusayev reports the work which has been concluded, the carrying out of the plan, and the condition of the secured aircraft to the squadron commander.

The experience of progressive officers convincingly proves that, -- with skilful organization and the creative conduct of a servicing day -- it becomes a reliable reserve for the growth of the aviators' aerial training and the combat readiness of aviation subunits, and consequently, a reserve for improving flight safety.

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AIR FORCES: PROFESSIONAL DEDICATION DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, 1980 pp 44-45

[Article by Capt V. Usol'tsev: "A Choice for Life"]

[Text] When Oleg Ivonin, a graduate of a military aviation technical school, arrived in the unit for the position of an on-board helicopter technician, the commander and his deputy for the Air Force Engineer Service decided that on the ground Capt Tech Serv V. Pankratov would help the lieutenant to become operational, and in the air Capt Tech Serv V. Kovchanich, an on-board technician-instructor and specialist firstclass, would take him under his sponsorship.

The deputy commander for political affairs supported them. "One can rely boldly on these officers. They know their job and eagerly help their comrades." He added: "Pankratov and Kovchanich will not only teach the lieutenant to service a helicopter but they will also teach him love for his difficult but necessary profession."

Love the the profession. In what is it expressed? Is it only in the fact that a technician always prepares a plane or helicopter in a timely and high quality way for flights? Of course not. There are officers who work this way but who nevertheless leave the specialty of an aviation technician without any special regret if the opportunity arises to transfer to a position which is not connected with working in the icy wind and burning cold of winter or under the scorching rays of the sun in the summer. One worldly wise aviation technician explained to me his love for his chosen profession: "You sleep -- you see the airfield; you wake up-- it begins to pull you, like a magnet, to the planes, although yesterday you were infinitely tired on the flights." It is simple and clear. Such people remain true to the profession which was selected in their youth and which does not indulge them in high ranks until the end of their service. Capt Tech Serv Vladimir Ivanovich Pankratov, chief of the helicopter flight's technical maintenance unit and a communist, is from their cohorts.

He has met the morning light on an airfield for 20 years. The officer cannot conceive of himself without the clear-cut rhythm of strenuous aviation work days, the roar of planes and helicopters taking off into the sky,a concern for the aviation equipment, and without those who work on it.

Vladimir has loved equipment from childhood and was ready to dig for hours in old alarm clocks, primus stoves, and bicycles -- he repaired broken things for all his neighbors. This affection for mechanisms led the youth to an aviation technical school. Having finished his training, he became a specialist on aircraft and engines. Vladimir remembers well the words of one of his teachers.

"That which you have learned and acquired here is only the beginning of true skill. Do not be ashamed to learn from experienced aviation specialists even if they are your subordinates. Work on your own constantly. Only then will you become a recognized expert in your field."

Lieutenant Technical Services Pankratov was immediately convinced of the correctness of these words. It seemed that the equipment was familiar and he had been taught to prepare it for flights, but everything did not go as he would have liked at first. Now, he forgot to check something; now, he did not confine himself to the periods prescribed for the work; now, he performed some operation incorrectly. However, no one kidded the young officer or reproached him for his mistakes. On the contrary, they encouraged him. They said it is rare for everything to go well for someone right away. They taught him how to correctly do this or that operation. Capts Tech Serv Nikolay Medvedev and Nikolay Kukushkin, Sr Lt Tech Serv Vladimir Belyayev, and the party and Komsomol activists helped Pankratov a lot during his formation. The young technician was soon permitted to service a fighter bomber. Officer Pankratov, as they say, armed himself with the example of concern, sensitivity and tactful persistence, with which his senior comrades had prepared him for independent work. He well understood that during army service he would repeatedly have to work with yesterday's school graduates.

The beginning specialist worked diligently on the aircraft. Returning from flights, the fliers invariably said: "No comments." Pankratov's authority grew, and his comrades treated him with great respect.

His deeds speak best of all about an individual. Pankratov was always in the thick of squadron activities, he became the leader of many good undertakings. Elected secretary of the Komsomol organization, he immediately proposed that his colleqgues spread the struggle for each Komsomol member to become a highly rated specialist and be the first among the young technicians to take the examinations for secondclass. The communists and Komsomol members planned to make a model of an airplane in order to acquire skills in chemically and radioactively decontaminating a fighter-bomber. The youthful leader took a very active part in this work. Somewhat later, Pankratov came forward with the initiative to create a trainer to train flight personnel for special situations during a flight and personally prepared its sketches.

Technical quiz games, thematic evenings, sports holidays.... The secretary of the Komsomol bureau devoted quite a bit of time to their organization and displayed creative inventiveness. Everything that the squadron's youth did, contributed to the growth of the subunit's combat readiness and to the improvement of flight safety.

Sometimes, a military man must change his professional orientation. This happened to officer Pankratov -- he was transferred to a helicopter subunit. It was required that he retrain in a very short time. "Will I manage?" he asked himself and then answered: "Why not? Others have been capable of it."

Pankratov mastered the rotary-wing machine excellently and serviced it intelligently. Some time passed, and he headed the technical staff of the flight. His concerns increased. The work on the helicopters, the organization of classes with subordinates, the direction of socialist competition, the indoctrination of the men -- each of these (just as other) matters requires quite a bit of work and expenditure of energy and time. Captain Technical Services Pankratov, the chief of the flight's technical maintenance unit and a communist, does not complain of being too busy. Interested in achieving high results in the combat training of the entire subunit, he displays concern not only for his own successes and the successes of his subordinates but also for those of the other subunit specialists.

If Vladimir Ivanovich sees an individual working listlessly, he does not avoid a serious and important discussion with him. You see, the complicated and stern equipment does not forgive flaws on the ground or in the air. The distance from laziness to a mistake is not great.

Once Pankratov learned that one of the aviators when adopting socialist obligations -- instead of outlining a higher frontier in professional qualifications -- had written: "to corroborate the title of aviation technician secondclass." Having selected a suitable moment, Vladimir Ivanovich approached him:

"Do you think to mark time in one place? Even those who arrived later in the squadron, are preparing to pass the exams for a firstclass rating. And you have more experience in servicing the equipment. It seems that your knowledge is also sufficient, but the rating is the same for another year."

His colleague objected: "It is completely sufficient for me. I work at the airfield with my secondclass rating no worse than some firstclass specialists."

It was not easy for communist Pankratov to convince the comrade that the struggle for a high rating is far from a personal matter. It was necessary to cite quite a few convincing examples. The officer, having sensed an injustice, reviewed the obligations and soon passed the exams for a firstclass rating. Somewhat later, he received the qualification of an expert. Then, that technician often recalled the kind words of communist Pankratov who had become an expert considerably earlier.

However, there is no doubt the officer devotes his primary attention to the growth in the training of the flight's technical staff. If he detects a deficiency, he tries to eliminate it right away; he is not calm until he has achieved his goal. He does not divide the matter into primary and secondary parts.

Once Vladimir Ivanovich noticed that one of the on-board technicians was marking things down carelessly in the service lists.

He asked: "What is preventing you from accurately filling out the documentation?

The officer was surprised: "Is that really the main thing? If I fill out the service list more accurately, my helicopter will not be better prepared because of this."

The chief of the technical maintenance unit calmly said: "It is possible. However you evidently have forgotten that carelessness in one matter can be transferred without being noticed to another and become a dangerous habit."

Pankratov cited convincing facts from life in support of his words. The young officer re-examined his attitude toward the performance of service duties. There were no more comments addressed to him.

Captain Technical Service Pankratov had to talk seriously with another subordinate about his attitude toward theoretical training, especially independent training.

Sr Lt Tech Serv Olev Ivonin is now chief of a flight's technical maintenance unit and a specialist with a high rating. It seems it is a long time ago that he arrived in the unit after completing school. Naturally, at first he did not have enough knowledge and experience. As a student he had mastered somewhat different equipment. Vladimir Ivanovich took Ivonin under his sponsorship and demonstrated how it was necessary to prepare a helicopter for a flight, and where special attention should be directed. He spoke about the purpose and operating principle of each assembly and instrument and explained what troubles could arise in them and how to determine and eliminate them. He strictly questioned Ivonin, giving him assignments for independent work. The efforts of the technical miantenance unit chief and the diligence of the technician gave good results.

Vladimir Ivanovich provided a lot of help to Sr Lt Tech Serv Sergey Alipov, a young technical maintenance unit chief who had recently transferred from ground work to flight work, and to many others. Painstaking work never goes to waste. In the flight where communist Pankratov is the chief of the technical maintenance unit, there are no preconditions for a flight incident nor are there any gross errors in work. As a rule, the ratings for servicing flights are only excellent ones.

... The chief of the flight's technical maintenance unit is full to the extreme with work; however, it seems that Vladimir Ivanovich grows young again surrounded by them. It is always possible to see him where the beginning technicians and mechanics are working. The aviation youth reach for the officer communist. They know that they will receive from him support in any situation or will simply hear a kind word. In these relationships is seen the concern of the chief and his subordinates for the high quality servicing of flights and for their safety. It seems that those whom Pankratov teaches and indoctrinates today, will love their profession as he himself loves it.

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AIR FORCES: AERIAL COMBAT TRAINING DISCUSSED

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[Article by Col Gen Avn S. Golubev, Hero of the Soviet Union and honored military pilot of the USSR: "The Rhythm of Combat Training"]

[Text] Summer is a time of intense flying work. Strenuous combat training is taking place in the classrooms, at airfields, in flight zones, and at ranges. Using the favorable weather conditions, the aerial fighting men are sharpening their piloting techniques singly and in groups and learning to inflict strikes on air and ground targets skilfully. Competing under the slogan, "To sacredly carry out Leninist precepts, improve combat and political training, increase vigilance, and always be ready to defend the motherland and the great accomplishments of socialism," the aviator fighting men are persistently achieving the planned frontiers in mastering the terrible weapons entrusted to them and in strengthening discipline, organization and teamwork of military collectives.

The winter training period was noted for steady indicators in combat and political training. Personnel in Air Force aviation units have carried out the obligations which were adopted for the 110th anniversary of V. I. Lenin's birthday and the 35th anniversary of the victory in the Great Patriotic War. The number of progressive airmen in training and of excellent crews and subunits grew, the level of the aviation specialists' professional skill increased significantly, their ideological and theoretical luggage was enriched, and combat readiness was raised even higher.

All this was the result of a lot of painstaking organizational and pedagogical work on the part of commanders, political workers, staffs, and party and Komsomol organizations. In following the firm principle "To teach troops what is necessary during war," they are doing everything so that combat training work in units and subunits will undergo a gradual build-up of complexity in the assignments in strict accordance with the requirements in documents regulating flying work.

The summer period imposes even higher demands on the organizers of the training process. The fact is that during this time -- as it is customary to say in aviation-- flying youth are on the wing. Recent school graduates are acquiring piloting skills as part of various groups and are receiving skills in using on-board weapons in accordance with combat missions. In other words, the young fliers and navigators are accumulating experience and receiving genuine military training. In connection with the high intensity of flying work, the physical and psychological burdens are sharply growing on fliers and the servicemen who participate in the organization and support of flights. Commanders must remember this constantly, notice the slightest change in the psycho-physiological state of subordinates, and take the necessary preventive steps so that the error which has been detected does not grow into a precondition for a flight incident. A strict instructional methods training sequence, the observance of flying service laws, and constant professional vigilance must be the reliable guarantee of flight safety, otherwise, there could be trouble.

Lt A. Gartinger was completing a flight to the zone using advanced piloting. Exactly according to plan, the flier executed a horizontal series and began vertical figures. Having passed the upper point of a Nesterov loop, Gartinger fell into an incomprehensible situation during its descending position. Not knowing how to act in such a situation, he made a decision and ... landed under the canopy of a parachute.

Why did the flier leave an aircraft which was in good condition? What was the true reason for such a -- let us say right out -- hasty decision? As it turned out, after Lieutenant Gartinger had finished a school for fliers, he -- having good teaching instincts and piloting techniques -- was sent to work as an instructor in another training establishment. The officer's flying experience using advanced piloting was not great. After a long break in this type of training at the new place of service, he flew about five hours solo. Flying instructor Capt V. Yevtushenko gave Gartinger several guided flights to the zone after which the squadron commander, Maj V. Bedich, checked the young flier--as they say--a little quickly and released him solo to the zone.

Actually, the flier was not ready morally and professionally to perform such an assignment, but the instructor had not been able to determine the level of his skills and psychological readiness. Major Bedich did not know the instructional methods preparation of Captain Yevtushenko and completely trusted his experience.

As practice shows, skill plays a large role in flying matters. The ability to track the process of its formation, development and strengthening is a very important quality of a commander and a true teacher. In order for a flier's training to take place successfully, it is very important to delve into the mechanism for forming skills and understand the processes occurring in the interaction between the individual and the equipment. When investigating the erroneous actions of a subordinate, an instructor often is satisfied with a superficial analysis of what happened and does not get at the heart of the matter. At the same time, any deviation, mistake, precondition, and finally, incident is nothing more than the result of gradually acquired errors which the student has not noticed before.

Indeed, any skill has a very complicated structure in which human -- that is, physiological and psychological -- and technical and other components are closely interconnected. The disruption of one of these links in this complicated system invariably involves a chain of deviations. This means that a skill will be formed incorrectly. In the final analysis this will invariably be revealed at some stage and will turn into an obvious mistake. It is good if it is displayed during the initial stage in the formation of an aerial fighting man. Then, it is possible to take the necessary steps in a timely fashion. It is very bad if a pilot with incorrect skills flies for a long time and even teaches others.

Commanders who train flying personnel must try to know literally everything about their subordinates and carefully observe the progress of their professional growth. Consequently, a systemic approach to the evaluation of their capabilities and a correct combination of rational training methods are required when mastering new types of training. Only with such a method is it possible to solve at a given stage the problem of high quality in the training of aerial fighting men and flight safety.

Advanced flying is the main type of flight training for aerial fighting men. Classical flying figures have been and remain the fundamental basis for combat maneuvering When mastering flying, a flier receives a picture of the plane's behavior and its stability and controllability at various points in the movement trajectory and learns to spread his attention and orient himself in space. Piloting skills, which have been reduced to the well known automation, provide a winged fighting man with an opportunity to devote his attention to searching for the target, selecting the advisable tactical principle or offensive maneuver, and carrying it out accurately.

It is necessary to master piloting gradually, proceeding from the simple to the complex. At first, figures are executed separately. It is only after skills are strengthened, that multi-execution is begun. Of course, this must in no way slow down the forward movement of the fliers -- based on the flying improvement program -- and the solution of other combat training tasks. Nevertheless, without firm confidence in the fact that a pilot has completely mastered solo flying, it would be rash to master group flying, especially maneuvering and aerial combat.

However, piloting is only one small (although an extremely important) component in the professional training of a pilot. The ability to skillfully use the on-board weapons in the situation which has taken shape -- here is what determines the readiness of an aerial fighting man to conduct combat operations. As a rule, this type of training evokes the flight personnel's special interest in its novelty and unusualness. When becoming proficient in combat employment, special military pedagogical expertise is required from commanders. Too, the teaching of bombing, firing and the launching of rockets is not everything. It is -- so to say -- only half the job. It is very important to teach a flier to evaluate quickly and intelligently the air and ground situation which is taking shape, and in accordance with it to make the optimum decision whose result must be an irresistible attack. To do this, various tactical tasks must be solved earlier during classes and short exercises, and the appropriate background must be created in order to check the level of the subordinates' tactical thinking. Good results are obtained when a commander assigns a task and the fliers (each on his own) find ways to solve it: Where and at what moment to use this or that maneuver or principle. A thorough and detailed discussion of the proposed solutions helps one to picture how to act correctly in the situation which has been created and expands one's tactical outlook. Thus, tactics are a fliers' second weapon.

It is necessary to say that a set pattern in tactics is not permissible. The experience of the Great Patriotic War and local wars demonstrates that he, who repeats one and the same principle, invariably suffers a defeat. Undoubtedly, a flier cannot remember the great number of combat principles, laws, and a situation will take shape so that not one of those learned will be the best. This means that it is necessary to find the required combination quickly and implement its solution correctly. Here, just as in music, seven notes provide an infinite construction of outstanding sounds. A flier who has learned by heart two dozen combat principles can vary them as the situation suggests to him.

Before starting to solve tactical flying tasks in the air, it is necessary to prepare the tactical and stationary ranges carefully, think out the target situation, and assign tasks to the AD systems for the opposition and cooperation of aviation with the other branches of service. When overcoming air defenses as a group, a situation is achieved where rational combat formations are selected in each specific case. Leaders must remember that the supporting airplane can effectively solve the assigned task only when favorable conditions have been created for it to maneuver; that is, open combat formations ensure freedom of movement, relative independence of the support aircraft, and the safety of group flights.

The tactical and gunnery training of flight personnel is checked during experiences where the situation is as close as possible to actual combat. During this period, the military qualities of fliers and navigators and their ability to solve complicated tasks on their own and to accurately hit an air and ground enemy are fully displayed. Lt Col V. Gaynutdinov, Maj V. Shcherbakov and Capt V. Korsakov -- first-class fliers -- have displayed exceptional self-control, composure and very high flying expertise during a complicated ground and air situation. The time expended by them on classes, was not in vain. In the air, the fliers acted resourcefully, boldly and decisively and carried out the crucial task honorably.

The planned and instructionally consistent mastery of exercises exerts enormous influence on the quality of the acquired skills in combat employment. Haste and the forcing of a flier's training lead -- as experience testifies -- to queer consequences. The following case can serve as an illustration. It happened rather long ago, but from the instructional methods point of view, it can serve as a good lesson for commanders.

Maj N. Baklagov had returned from a scheduled leave. Desiring to put the experienced instructor into operation a little more rapidly, the commander planned a flight for him to the range in a combat aircraft after a check-out and then a solo flight. There was no break for the pilot in this type of training and the requirements in the documents requesting flying work were seemingly observed. The pilot did everything necessary on the ground. His accurate answers during the check of his readiness testified to this.

The airplane is in the air. Although the flier had flown to this range many times, he found the target field with difficulty. He had to circle several times in order to inflict a bombing strike on the target and then fire his guns at it. As is known, the fuel reserve in a fighter is not great, especially when a range is located a considerable distance from the airfield.

Having completed the assignment, the flier checked the fuel remaining and determined that it was less than that required for a safe return to his point. Naturally, nervous tension grew.

Having asked for a bearing, Baklagov erroneously adopted a course which did not correspond to the one given by the radio DF station. When the time provided for this segment of the route had passed, the flier did not detect the distinctive reference points. Then he understood that he had made a gross mistake. It was necessary to do something. Undoubtedly, in such a situation an experienced flier will mobilize his will and do everything necessary to complete the flight safely. Unfortunately, Major Bakiagov's actions were not noted for strict purposefulness. He reestablished the reference point and turned towards the airfield; however, he was not able to make it to it. He had to land at an intermediate one. As they say in such cases, the flier had a narrow escape. However, an extraordinary occurrence had taken place What was more disappointing was that it had happened to an aerial fighting man who had a lot of flying experience and good preparation for combat employment. In a frontline situation, such an event could have ended extremely worse.

However, let us try to investigate the reason for what happened and where its source lay. Let us begin with the planning. Was the commander right to plan a flight to the range for the pilot right after his arrival in the unit? On the one hand, there were no violations of the guidance documents since there was no break in the combat employment flights. On the other hand, the clear forcing of the instructor's readiness to function is observed as is the failure to consider the psychology of an individual who has still not renounced his leave impressions and truly entered the rhythm of combat training. Moreover, the commander did not know the personality peculiarities of the flier and his character features. Essentially, Bakiagov was not ready to perform the assignment at the range although everything seemed well outwardly. He himself recognized this but was not able to refuse the planned flight. They say, but what will subordinates say about him? Such false shame muffled the voice of wisdom and blunted the sense of responsibility for his readiness for the flight and its favorable outcome. As a result, it was only an accident that the plane and flier remained unhurt.

The aerial training and the tactical and gunnery expertise of the winged defenders of the socialist homeland are at the center of attention of commanders, political workers, and party and Komsomol organizations. It is due to their credit that socialist competition effectively contributes to the mastery of everything new and advanced in the use of equipment and weapons and of unexpected tactical principles, and of ways to inflict accurate bombing and gunnery strikes from any position.

When organizing flights, it is necessary to pay attention also to the following item which is of no small importance. As is known, the flying of a pilot during the day and night and under simple or complicated meteorological conditions is one of the objective indicators of his aerial training and flying experience. It is completely natural that, knowing this, commanders try to ensure the advancement of their subordinates along the program and maximum flying. One path is to move further along the combat training program after performing all the [illegible] exercises. The other one -- increasing the duration of a flight -- is the easiest and does not require any effort.

Once Maj M. Konfindratov, a squadron commander, moved along the following path. Auxiliary fuel tanks were hung on the fighters for route flights, and the young fliers made extra passes along different sectors of the route. Thanks to this, the squadron was in the ranks of the progressive ones in flying. However, if you think about it, it is possible to conclude that, first, an "empty" flight provides nothing for the fliers and second, fuel and motor resources are expended unproductively. Such a practice, which is essentially fallacious, testifies to the fact that individual commanders resort to eyewash in pursuit of illusory success. Not only their own but also the collective's authority suffers from this. The instilling in personnel of high ethical and political qualities, moral purity, and a self-critical and principled attitude toward the task must be subjected to the great attention of the command element, political organs, and party and Komsomol organizations.

The summer period is characterized by the overcoming of simple meteorological conditions. At this time, young commanders, who still have little flying and instructional experience, are beginning to fly as instructors. This places definite responsibilities on commanders who organize flying work. It is very important to put right the careful planning of flying shifts, the strict and detailed control of training, and the critique of the flights using all existing auxiliary systems. Unfortunately, cases of the flying staff's underestimation of objective control systems are still encountered, although each knows that objective control system notes provide the richest material on the way an assignment is carried out, and consequently, on acquired skills. What is the matter here? Evidently, in the flow of daily affairs, some commanders forget to study and systematize this information, and the fliers themselves because of a lack of knowledge of decoding methods and the inability to use the appropriate equipment try to avoid this. In those units where the flying staff uses objective control systems skilfully, the quality of combat training is higher, there are fewer mistakes in piloting techniques, and flying skill grows more rapidly.

When solving tasks according to the combat training plan, it is also necessary to maintain instrument flying skills continuously and to train in circling for a landing using modern aircraft and ground landing systems in conformity with weather lower than the prescribed minimum. In other words, it is always necessary to be fit so that complicated weather does not catch a flier unawares.

During the strenuous rhythm of combat training, winged fighting men improve their ideological and theoretical training; strengthen military discipline, order and teamwork; and improve piloting, tactical and gunnery skill. Faithful sons of their people, inheritors and continuers of the combat glory of front-line soldiers who defended the honor and independence of our wonderful motherland during fierce battles, they are strengthening its defensive might without sparing any effort and are ensuring the peaceful work of the builders of communism.

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AIR FORCES: FIGHTER-BOMBER TRAINING DESCRIBED

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[Article by Col E. Solov'yev, expert military pilot: "The Weather Introduced Adjustments"]

[Text] The silvery sheet of the clouds remained below and the bright light of the sun poured into the cockpit. Without decreasing the climb angle, Lt Col V. Davydov looked in the periscope. His wingman, Capt Yu. Muratov, moved with a small increase so that the sun would not disturb him. Slightly lower, a second pair emerged from the clouds, and Capt Yu. Pysh'yanov and Sr Lt N. Pavlov soon took their places in the combat formation. The flight deployed on the assigned course. It is still a long way to the range. The "enemy's" detectors do not observe the fighter - bombers and therefore it is possible to occupy a slight higher flight level.

Brief commands are heard in the headsets. It is the two other flights, which took off before Lieutenant Colonel Davydov's group, travelling to the target.

Everyone knew that the unit personnel had to participate in a tactical flying exercise, but the higher headquarters had not informed them of the day it would begin or of the proposed goals. Yes, this is evidently correct. It is much easier to work from prepared data, but as is known, the true level of the fliers' training and combat skill is checked during an exercise. The combat capability of a flight, a squadron and the unit as a whole can be objectively evaluated only under conditions which approximate combat ones as closely as possible.

During the period preceding the beginning of the exercise, party meetings were held in the subunits. During them, concrete measures for high quality preparation of the men and equipment for it were outlined. The communists' spirit of high principles and their exactingness in evaluating their capabilities made one happy. It was felt that the men grieved over the state of affairs, and the grade, with which the inspectors rated the regiment's combat training, made no difference to them.

During this period, the staff again firmed up the level of each flier's training and the breaks in flying for the types of training, and drew up a plan for making effective those for whom undesirable breaks had been detected. It was suggested that all flight personnel could take part in combat training work before the beginning of the exercise.

The command element paid special attention to the fliers' ethical and psychological training, the group flying of the flights, and correct coordination on the ground and in the air. Each check-out flight is used with maximum effectiveness for this.

The socialist competition which was spread during these days between the flights and squadrons assumed a combat form. The daily summation of results in the flights permitted deficiencies and lags in the plan, which were revealed during the training, to be reacted to effectively. Exchanging the experience of progressive aviators was widely used. Everything new, which was found in the training process, was incorporated into the work practices of flight and engineer-technical personnel. Increased socialist obligations were not adopted at random but with a consideration for each one's capabilities. The commanders and party and Komsomol activists skillfully supported this high mood, provided timely help to those lagging behind, and singled out the best ones.

Individual training plans, whose points were original steps in the growth of skill, helped the aviators very much. The men accurately pictured the tasks facing them. As a result, by the beginning of the exercise they were ready to perform assignments under easy and difficult meteorological conditions day or night.

Roused by the "assembly" signal, the unit personnel began the combat training work. The task: to destroy helicopters which had been detected by aerial reconnaissance. A group of fighter-bombers consisting of three flights rose into the air.

The ground was solidly covered by clouds: small breaks appeared only seldom. They quickly moved to the southeast.

Davydov noted to himself: "A very strong wind. It must be considered during the bombing."

How could one bomb if the ground is again concealed by a white carpet from one's eyes? Such weather is very inopportune. Although the airplane's navigational equipment will help them to arrive in the target area exactly, the target can only be attacked visually since friendly troops are near-by according to the exercise conditions.

The ether reported the commands of the flight director at the range to the first of the group's flights. It was clear that the conditions for operating did not exist and the fliers were re-aimed at the alternate target. Major A. Zhukov's group was still in front of Davydov's flight. Will they really not manage to break through to the target? It is a pity! The fliers had prepared for this assignment very carefully. Various attack methods had been worked out, possible deviations from the primary versions had been considered, and corrections had been calculated in advance for each deviation from the prescribed dive angle, altitude and speed. The "dismounted from the flight" gaming and the readiness check showed that the fliers were completely ready to solve the assigned task. However, the weather had incorporated its own adjustments in this orderly system.

According to the calculations, the line for beginning the descent had drawn near. Using movements of the aircraft, Lieutenant Colonel Davydov ordered the support aircraft to follow him, and the flight levels. The coordination of the fliers' actions which had been developed on the ground and during training flights was especially evident at low altitude. At the very edge of the clouds, the group increased speed.

However, the "enemy" nevertheless discovered the fighter-bombers.-- probably from the radio transmissions of the first flight. Before the target area, radio jamming choked the communications channel, and the fliers had to change channels frequently. This complicated the main work.

Lieutenant Colonel Davydov ordered the support aircraft to open up. In this situation it provided the pairs greater freedom in selecting a maneuver.

Having evaluated the instrument readings, the leader brought the plane into a climb. The target should now be on the left. Suddenly, he heard Maj A. Zhukov's voice in the ether.

"A break in the clouds is approaching the target, permit me to attack."

This means that an opportunity to attack had appeared.

Davydov brought the machine into a turn. The support aircraft, as one, repeated his maneuver. At the end of the turn, the leader noticed a dark break in the cloud blanket and four silhouettes of aircraft, breaking from the "window." It was Zhukov's flight which had finished its work on the range.

"Zhukov had to break combat formation," Davydov thought to himself and ordered the second pair to increase its distance. The break was quite small. The slightest error and the bombs would fly by.

There was just enough time. The "window" was quickly shifting to the side, and the target would again be concealed under the clouds. It would be a pity. They had flown exactly according to the route and they were not able to attack. However, the break was quite near. The target was still not visible, but the base reference point could be well seen in the haze under the clouds. Lieutenant Colonel Davydov brought the airplane to the "window". An energetic turn to the left and he guessed the target exactly on the course sooner than he saw it. However, as he approached, the contours of the helicopter hardstand showed through more clearly.

The lieutenant colonel's conjecture that the fliers in Major Zhukov's flight had not considered the wind, proved correct. Craters were still swirling with dust to the left and slightly in front of the helicopters -- a shot over the target. It was impossible to miss now. The leader understood this well. He turned the machine a little into the wind. Captain Muratov repeated the leader's maneuver exactly. The helicopter parking area was in the reticule of the sight. It was necessary to wait for the release; the dive angle was less than the calculated one. Now it is time! Simultaneously with the command "Release", Davydov pressed the combat trigger. Freed from the bombs, the pair energetically flew upward. Powerful explosions rose where the helicopters had stood a second ago. Captain Pysh'yanov's pair also inflicted an accurate bombing strike.

However, this is not all. It is possible to strike again with rockets while the target is uncovered. Now, dynamism and accuracy of actions are needed. In a minute the parking place of the helicopters will be concealed from view and it will be too late. The base reference point is already being socked in by the clouds. The clouds are rushing over the ground very quickly. It is now possible to determine the location of the target only from visible reference points. Visibility sharply deteriorated. However, here is a characteristic bend in the forest under the wing. The main thing is to adhere to the input parameters more exactly. Having evaluated the situation, Lieutenant Colonel Davydov brought the airplane into a dive. The support airplanes rushed after him. The angle was still too small. A certain tenacity was needed. The distance decreased with each second. The target finally appeared in the fire and smoke. Several helicopters had been destroyed. However there was no time to look around. Having placed the center mark on the undamaged machines, the fliers opened fire. The missiles rushed toward the ground like comets with tails. The fighter-bombers flew sharply upward.

After several seconds, a fiery whirlwind again plastered the ground -- Captain Pyzh'yanov and Senior Lieutenant Pavlov had wrought this. Now, this is all. Under the difficult weather conditions, it would have been difficult to solve the task better.

The flight assembled above the clouds and returned to the airfield at full strength. While still in the air, the leader learned that the results of the strike were "excellent". Of the seven helicopters located on the hardstand, five had been destroyed and two damaged. The work of the group's pilots, which had been spent on the preparations for and solution of the complicated task, was repaid a hundredfold.

On the eve of the 35th anniversary of the great victory, the aviators once again proved that they are worthy continuers of the glorious military actions of the older generations who defended the freedom and independence of our motherland during the terrible years of the Great Patriotic War.

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AIR FORCES: ASSISTANT FLIGHT CONTROL OFFICER DUTIES DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 pp 6-7

[Article by Lt Col V. Shulenin, military pilot firstclass: "When the Assistant to a Flight Director Is Silent"]

[Text] Having completed a fourth turn, the plane entered the glidepath. The ship's commander, Capt S. Blokhin, brought the machine into a descent.

"Range five, on course, in the glidepath." He received the information from the ground.

It was a fine sunny day or -- speaking in professional language -- the meteorological conditions were easy. A slight crosswind was blowing.

The bell of the marker beacon radio receiver began to ring. Only seconds remained until the end of the flight. Captain Blokhin accurately kept to the piloting conditions. However, after the near approach stage when approaching the landing strip, the flier unexpectedly increased the vertical descent speed. It seemed that the plane would land short.

"Don't descend! Pick it up!" Capt V. Yaroshevich, the assistant flight director, requested calmly but decisively.

The flier immediately carried out the command and managed to correct the error. The air ship reached out to the cement pavement and landed at the beginning of the runway.

At first glance this episode was insignificant. Captain Yaroshevich, being on the launch detail, had performed his duties, all told, conscientiously. At the same time, it is necessary to note that his careful attitude toward work and professional vigilance permitted the necessary command to be issued in time and the error to be averted.

In a similar situation, Capt A. Nikitin, a flier, allowed the preconditions for a flying incident. When landing at another airfield he landed the airplane roughly somewhat short of the runway. During this, Maj A. Petrov, the assistant flight director took the position of a passive observer although the deviations from the approach could be well determined from the ground. Observing the plane's premature descent, he kept silent and, consequently, did not help the flier to correct his error during the landing on a timely fashion. Meanwhile, the assistant director as part of a specially selected group for directing flights for the 24-hour period had flown to this airfield, and the time was sufficient for his preparation.

Captain Nikitin is an officer with good prospects and a member of the party committee. He has earned the authority and respect of his comrades by his conscientious attitude toward his service duty and by his active participation in the unit's social life. He always flies smoothly without deviations.

An analysis of this case showed that the flier had needed elementary prompting from the ground. The magnetic tape recordings and the MSRP tape confirmed that he had directed the crew accurately and in accordance with the instructions, and that he had maintained the assigned speed, considering the flying weight, irreproachably during all stages of the landing approach. However, during the discussion it turned out that this time the crew commander had entrusted the calculation of the balancing to the on-board technician and did not check it himself. Because of the depletion of fuel, it shifted forward, and an additional diving momentum was created. Captain Nikitin did not consider this feature and he could not take it into consideration because of the inaccurate calculations. When approaching the strip, he concentrated all his attention during the alignment on the elements of an accurate landing. The increase in the vertical speed of descent before the landing was a surprise to the flier. Nikitin hardly had time to pull the control column toward himself so as not to land on the ground.

Of course, the ship's commander had laid the preconditions for his own guilt. Nevertheless, without at all justifying the flier, it is appropriate to ask the question: "Where was the assistant flight director looking? Why did he keep silent?"

Cases are known where fliers get into difficult situations because of unexpected changes in the weather (a snow squall, rain, fog) during a landing approach. However, when analyzing the preconditions for flying incidents, nothing is usually said about the actions of assistant flight directors. Is this correct? When observing an airplane coming in for a landing, an assistant flight director sees all deviations and, if he is sufficiently experienced, has an opportunity to correct them. Thus, Capt V. Mikhaylik, being an assistant flight director, issued a timely command to the crew about going out for a second circle. Objective control material confirmed that he helped to avert a flying incident. The unit commander commended the officer that day.

Statistics show that flight personnel make mistakes and deviations most of all during take-off and landing. In connection with this, a great deal of attention is being devoted to the role of the assistant flight director. The zone of his responsibility for safety is defined by the guidance documents, the right to permit or forbid a take-off and landing has been given to him. However, there is still unfortunately no list of mandatory commands which he must give in order to help a crew during these stages of a flight.

Among the numerous moral and psychological factors which affect flight safety, the flier's confidence that he will receive highly qualified help from the ground, does not occupy the last place. In this connection, I would like to emphasize the following. The norms for evaluating piloting techniques have been concretely worked out with a consideration for possible deviations. They are identical for everyone. Consequently, during the landing of a flier with little experience, an assistant flight director must not simply fix on mistakes, but must actively help him. There are examples where young fliers, having completed the preconditions for a flying incident, have not been able for a long time to quickly acquire confidence, and quite a few check-out flights have to be given to them during their formation.

Col Gen Avn V. Kubarev, Hero of the Soviet Union, wrote in his book "Atakuyut Gvardeytsy" [Guardsmen Attack]: "A flier, who has won his first victory, almost immediately becomes a mature fighting man. Faith in his strengths appeared in him, he felt at ease in the air, he saw the battlefield better, he piloted the airplane better. Conversely, if a flier suffered a defeat in his very first battle, he never found in himself the moral strength for his subsequent formation after this.

During the combat training process, a flier's faith in his strengths help him to use the airplane's capabilities effectively. This factor acquires special significance during retraining on new aviation equipment when successfully performed first flights become the deciding condition for rapid mastery of the new machine and mastery of the heights of combat skill.

In the unit where Lt Col G. Sheverdenok serves, the erroneous actions of flight personnel have been analyzed for several years in the instructional methods council and they have determined when the flight director and his assistant can help a flier to execute a take-off and landing. They have outlined measures to prevent mistakes by the members of the group directing flights. In particular, they have proposed that the assistant flight director during the group's preliminary preparations study the errors made the last time by those fliers who are to take part in the flights. In accordance with the guidance documents, these mistakes are entered in a special log. Training sessions, during which landings-- recorded on movie film during the previous flights -- are shown, are conducted with the flight direction group. In addition, it was recommended that only experience firstclass fliers be assigned to the launch detail when performing flights below prescribed minimum weather conditions.

In the instructional methods council, the question of developing instructional methods manuals, which would give practical advice and recommendations to assistant flight directors, was raised. It was decided to involve them in the meetings together with the directors.

The documents, regulating flying work, impose upon the assistant flight director the duty of helping fliers to correct mistakes during a landing when it is necessary. But how to determine this necessity? What commands to issue? These are still not in a single instructional methods manual. It is hardly possible to work up a single method for the actions of an assistant flight director in each specific case and for all aviation branches and services. It is possible though to provide a lot for aircraft of a certain type which are based at a given airfield. These questions were at the basis of the discussions in the instructional methods council. It is early now to speak about the results of the measures which have been planned and conducted. The preparation of an assistant flight director to provide highly qualified help to a flier requires time. This question deserves attention.

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AIR FORCES: FLIGHT COMMANDER'S TRAINING ROLE STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 p 8

[Article by Maj A. Drozdov, military pilot firstclass: "Think Before...."

[Text] Lt A. Korotkov wilfully changed the flight altitude during one of the segments of the route. As it later turned out, the flier was confident it would go unpunished. And not without justification. His flight commander, as a rule, analyzed testing and recording data superficially, without going into it deeply. However, this time the squadron commander reviewed the tape. He detected the deviation from the prescribed flight conditions.

Another example. Lt B. Debol'skiy, when piloting in the zone, created more than the permissible load on the aircraft. After the landing, he honestly reported what had happened to his commander. The young officer's actions were seen as a lack of discipline and he was barred from flying for several days. However, during a careful critique of this flight it turned out that the cause of everything was a gap in the pilot's training. He had not been shown how it was necessary to operate the controls intelligently during a flight when performing vertical figures.

The truth triumphed, just as in the first case, after the intervention of the senior chief. Why weren't the flight commanders up to it? With a correct approach to the evaluation of a flight, they can completely and objectively investigate a situation without any special difficulty. Their authority can only grow from this....

The author of the article "A Shining Halo" (AVIATSIYA I KOSMONAVTIKA, No 9, 1979) touched upon the subject of discipline in flight work. It goes without saying that in one article it is impossible to even simply list all the factors affecting discipline -- not to speak about their analysis. Nevertheless, in my opinion the most effective method in the struggle for strict observance of the laws of flight work is correctly arranged indoctrinational work with the flight commanders. You see, a flight commander directly trains and indoctrinates ordinary fliers; lays the foundation for future combat skill; and finally, whether a lieutenant, who has arrived from a school, will keep his love for the difficult work, which is connected with the chosen profession, mainly depends on him.

Therefore, indoctrinational work with flight commanders requires a special approach and the constant attention of senior commanders, and high exactingness and control over their training. A poorly trained and undemanding flight commander will not be able to earn authority from subordinates, and this means that he will not be able to train them successfully.

There is nothing new here. Theoretically, everyone knows this. However, why do situations similar to those cited, arise?

Two violations. The first one -- let us say right out -- was the result of the flight commander's irresponsibility and possibly his desire to earn the respect of a kind chief. You see, aviation practices eloquently show that it is difficult to find a greater evil than such "kindness". Experienced fliers know what harm it turns into at times.

Lt B. Debol'skiy's immediate commander also does not appear in the best light. As a result of the hasty decision made by him and the unobjective evaluation of the subordinate's actions, an undeserved injury was inflicted on the young flier. This also is a violation of discipline.

Flight commanders basically justify the trust shown in them honorably. However -- although infrequently -- I have had occasion to hear from some of them the following reason when they explained to them the inadmissability of treating prescribed rules freely. That which you can use is fully written in regulations. Dry nursing subordinates is not commander's work. One was punished with all severity to keep others from it.

I think that it is necessary to talk at the top of one's voice about solitary instances of such an attitude toward one's service duties. I am completely in agreement with Lt Col V. Shishkin, the author of the article mentioned above that each -- even the most seemingly insignificant -- violation of discipline in flight work must not remain without attention but also must be investigated thoroughly and an exhaustive analysis made. Of course, in no case should people be punished without an investigation. In order for this to become a rule, it is necessary to know one's subordinates very well. In this respect, a flight commander -- like no other -- has a great deal of opportunities. A well trained and instructionally erudite flight commander is the chief indoctrinator and teacher. The flight is the primary subunit where the features of an aerial fighting man's character are forged.

For example, Lt Col K. Musiyenko, a squadron commander and military pilot first class, pays very serious attention to the training and indoctrination of flight commanders and the strengthening of their work authority. Having studied their characters and inclinations, Musiyenko develops in them initiative and creative keenness of wit and teaches them to work for the long term. If blunders occur, a highly principled evaluation is given to them and each case is discussed in detail. A final decision is submitted only after this.

Joint training sessions of the flight commanders and fliers are practiced in the squadron. The classes, which Maj A. Fedosov -- the commander of an excellent flight and a military pilot firstclass -- conduct, are especially instructive. The officer keeps a special notebook where he enters the actions of his subordinates in special cases during flights on trainers. Based on the notes, it is possible to follow how the knowledge of each flier is growing and how his skills are being strengthened. The training sessions provide mutual benefit to the commander and the subordinates.

Their flying fortunes sometimes entirely depend on the flight commander and his persistence and faith in his subordinates. I remember when Lt V. Rybalko arrived in the flight. It was impossible to call him a good pilot. He often made mistakes in piloting techniques and at times committed gross preconditions for flying incidents. The question of removing him from flying work had already sharply gathered steam. However, Capt V. Khoryshev, the flight commander, insisted on the lieutenant remaining in the flight. It was not easy for the commander. However, Rybalko mastered the combat equipment, and things took a turn for the better for him. Now, the officer himself successfully commands a flight using much of that which Captain Khoryshev taught him at one time, in his training practices with his subordinates.

Flying work is complicated and multifaceted. It requires intense effort, creative energy and a strong character from the people who have dedicated their lives to it. However, it primarily demands strict and conscientious discipline without which conversations about the romance of the flying service and the love for it, and the counting on serious successes will remain barren phrases and a vain dream.

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AIR FORCES: TACTICAL EXERCISE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 p 9

[Article by Guards Maj P. Chernoknishnyy, military pilot firstclass: "The Guardsmen Are Attacking"]

[Text] The flights had ended. A quiet evening fell on the airfield. The aviators having completed their work, slowly dispersed to their homes. Tomorrow, as usual, there would be a formation in the morning and then preliminary preparations. However, higher headquarters decreed otherwise. A siren sounded in the pre-morning quiet. The exercises began in this way.

The task had been given to the unit commander to move a squadron to another airfield. He was faced with a flight to maximum range. After the necessary preparations, the planes lined up on the strip and took off into the sky in pairs. Having assembled, the squadron set out on its course in correct combat formation. The route was not a simple one. It had many breaks and landings at intermediate airfields. This imposed special responsibility on the commanders since some fliers were performing such an assignment for the first time. However, the aviators managed the task.

The well organized work of supporting the redeployment and of providing maintenance at the intermediate airfields permitted the planes to be prepared for the next flight in a very short period. Guards Sr Lts Tech Serv V. Musikhin, S. Yudashkin and P Reznikov; Guards Lts Tech Serv V. Tarasov and S. Belousov; and Guards WO's [Praporshchik] F. Sheshtokas and I. Pedash worked in an excellent manner. Having demonstrated skill and effectiveness in working under severe shortages of time and having shown a thorough knowledge of aviation equipment, they prepared the combat machines with high quality.

Finally, the difficult re-deployment was completed. The fliers who had participated in such exercises for the first time received good training in aerial navigation and in maintaining communications while passing control to the cooperating command points. However, it is still early to be unnerved. In a situation, as close as possible to a combat one, the aviators will conduct actual launches of live rockets against radio-controlled targets. The results of these firings will show the fliers' real training level and their skill and combat readiness. The guardsmen are facing a test of combat maturity.

A fighter pilot must master the combat machine perfectly and be able to intercept and destroy an enemy under any conditions at the prescribed line. He is answerable for this to the motherland. For the sake of one attack successfully carried, a flier expends months of strenuous and painstaking work, studies tactics, and aerodynamics thoroughly, and improves his ideological moral and political level steadily.

In day-to-day flying, the results of the accuracy of an aerial fighting man's strike are evaluated using the objective control material and there are certain tolerances within the limits of "excellent", "good", and "satisfactory". There are no tolerances during exercises with the actual use of combat weapons. Here, they judge by something else. Shot down-- not shot down. This is the criteria of a flier's work in the sky --just as in actual combat.

It is very important in such a strenuous situation to set, as they say, the tone. You see, a lot depends on a successful beginning. Therefore, the command post sent Guards Lt Col S. Kachankin's -- an experienced aerial fighting man and a firstclass pilot -- flight against the first target picked up by the detectors.

The target appeared on the edge of the circular-scope indicator screen. Guards Sr Lt M. Gadchenko, the tactical control officer, sensed it before he saw it. The navigator picked out the target blips among the jamming, determined the course and flight altitude, and the command flew into the ether to Kachankin's flight.

"Course 350, altitude...."

The leader answered. "Understood, I am executing it."

The interceptors deployed on the assigned course. The flight of fighters raced at enormous speed to the intercept point. Here is where the results of painstaking training on the ground and of guessing the joint actions of the fliers and command post teams tell.

Guards Lieutenant Colonel Kachankin glanced at the combat formation. The support planes were following him in exact formation. Having prepared the weapon's system to operate, the leader began to search for the target using the on-board sight. During a group intercept, the earlier a target is detected, the greater the freedom of action of the supporting aircraft. The blip from the target appeared on the edge of the sight at the maximum detection range. It intersected the indicator's field at a small angle. An energetic turn, and the "enemy" froze on the zero azimuth. The approach -- the target is locked on. Seconds of the greatest tension.

"Locked on" sounds in the ether. After several moments, "Launch!"

A rocket tore away from under the wing like a fiery comet. The flight went into the attack with an energetic maneuver. The target fell to pieces in the air from an accurate hit.

The tactical situation had been complicated by the fact that the route and altitude, along which the radio-controlled targets were flying, were not known to the flight personnel or to the CP teams. Therefore, exceptional skill was required from the flight controller, Guards Senior Lieutenant Gladchenko, and the man tracking the targets, Guards Sgt A. Yudin.

Guards Lt Col S. Kachankin's flight was already returning to the "point" when the operators located a weak blip on the screens. The "enemy" was penetrating to the protected installation using heavy jamming. A clear command and a pair of fighters took off for the intercept. Guards Capts N. Pravuk and V. Mulack, accurately carrying out the commands from the command post, pursued the target. The approach speed was enormous. Under such conditions, a second attack is almost impossible since during the time the interceptors are again occupying a favorable attack position in the event of a failure, the "enemy" will reach the line for using his on-board weapons. One cannot allow this.

The target dot is in the lock-on zone; the range is decreasing rapidly. Now, the "enemy" cannot escape the destructive blow. Tenacious beams are reliably keeping him in the necessary zone. However, the target blip on the screen unexpectedly jumped up and moved downward. The lock-on is broken. It is impossible to repeat the attack. The leader clearly understood this and therefore, made the only correct decision in this situation. The command flew into the ether.

"020, I am breaking off the attack; 021, attack!"

Guards Captain Pravuk moved to the left with an energetic maneuver and banked. The flier saw how the missile, launched by his wingman, overtook the target. There was a blaze of fire in the air, and fragments began to fall in confusion from the white cloud which had formed. The "enemy" was no more!

During the critique of the exercise, the regimental commander held this pair's actions and their teamwork and mutual help up as an example. Guards Capt A. Smirnov's flight also showed excellent combat training. The aviators accurately hit a target flying at low altitude.

During these flying tactical exercises, all aerial targets were knocked down on the first attack. The fliers, flight controllers, technicians, and mechanics demonstrated high organization, correctness of actions and professional skill. The guardsmen passed the test for combat maturity successfully. Many received excellent ratings. The commander of the district's Air Forces awarded valuable gifts to Guards fliers S. Kachankin, V. Mulack and A. Smirnov for their high flying skill in solving combat tasks.

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AIR FORCES: EXPERIENCED HELICOPTER PILOT DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 pp 12-13

[Article by Capt S. Tolstoy: "The Crew Will Perform the Assignment"]

[Text] The senior chief said:

"Watch Fursov at work. You will immediately notice that he does everything on the ground deliberately. However, behind this deliberation are concealed the substantial preparations for each assignment which are needed in the flying profession."

I am lucky. A tactical flying exercise is taking place during these days. All the squadron's personnel were undergoing a serious test. However, it was more critical for those who had just mastered a combat helicopter under the direction of communist officer V. Fursov and other experienced instructors.

The aviators were worried. This was sensed from the interest with which the fliers looked through the special literature and from the numerous questions addressed to senior personnel. Meanwhile Valeriy Kirillovich was the personification of tranquility itself. His answers sounded well-reasoned although they were rather laconic.

Fursov advised one of the crew commanders: "Keep your position more exactly in the combat formation if you would operate so...."

"Understandable", the pilot nodded with his head.

"And you", Valeriy Kirillovkch answered another aerial fighting man's question, "pilot the helicopter more accurately when attacking a ground target. Then, firing results will be higher."

"I will take the comments into consideration," the subordinate assured.

Fursov indeed spoke deliberately as if selecting his words and then weighing them again. I later learned that this manner had remained with him since the years when he was an instructor in a school. It is easier for a student to comprehend and remember what has been said and to understand its essence.

Having answered the questions, the officer got a flight map and looked at it attentively for several minutes. He had to fly to the exercises as part of a group of helicopters, and Fursov was thinking about how best to carry out the assignment which had been received. Having made a decision, he beckoned the fliers.

"Look carefully," a pencil had outlined a small circle on the map. "Here is a crossing. Based on reconnaissance information, a column of 'enemy' tanks is moving toward it. Here, I think, is the handiest place to destroy it. However, it will not be easy to do this", Fursov continued . "The area is covered with air defense systems. The leader has selected the third route version for the flight to the target."

The officer firmed up where -- in accordance with the group commander's plan -- it was necessary to execute evasive actions and anti-missile maneuvers. Then, he advised how it was necessary to act in the event the opposing side's fighters were encountered. Again Valeriy Kirillovich's voice sounded measured and deliberate and such were the gestures with which he reinforced his words.

Fursov had a good view of the group's formation. The officer leads one of the pairs. He had enough attention for everything -- both to keep his position in the combat formation and to observe the actions of those whom he had recently taught. The experienced aerial fighting man has confidence in himself, his operating of the control levers is sparing to the extreme -- just like filigree work, and he carries out the leader's commands immediately.

The helicopters are moving hugging the earth. The line of contact was behind them. Forest massifs, population centers and the intricate interweaving of roads sail past below.

I look at my watch. It is time for the crossing to appear. And so it is. The chain of pontoons is seen in the distance, a column of "enemy" tanks is approaching it.

Having maneuvered, the group approaches for the attack. The traces of rocket projectiles speed to the ground from the forward machines. The turn comes for Fursov's pair. His voice rings out calmly and authoritatively.

"Climb!"

It's as if the ground is disappearing. G-loads press on the body. And then -- the dive.

"Fire!", Fursov commands.

The attack. Another. And another. The job is done. Just as unexpectedly as they had appeared, the helicopters leave the target.

"The pupils proved themselves excellently", Fursov confidently concluded after landing.

The movie sequences, which we watched together on the screen in the objective control room, confirmed this completely. Capt A. Sharchevich, Sr Lt A. Vasil'yev, and their comrades received the highest ratings for the difficult flight. This means that the work during the preparations to retrain the subunit's fliers was completely repaid.

Valeriy Kirillovich has engaged for long years in instructional work. He began on a fighter in the school where they kept him immediately after he finished his studies. He had already at the time showed himself to be a knowledgeable and skilful teacher. Col E. Yesipovskiy, an honored military pilot of the USSR, has said the following about Fursov.

"It seemed that there existed nothing personal for him. He spent a lot of time with us, the students. He explained until we remembered the material. When some element did not turn out well for us, the instructor demonstrated it again and again -- until it was completely mastered. And all this Valeriy Kirillovich did calmly and thoroughly.

Skill grew and Fursov's authority grew. The officer carefully adopted the experience of experienced teachers in working with youth; he tried, like they, to keep his composure and be tactful in even the most difficult situation. He loved his difficult work and experienced a great deal of satisfaction when the next group of future fliers firmly took to flying. However, life decreed in its own way and sharply changed his fate. At the time a captain, he was called to the headquarters and told:

"How would you look on it if we sent you to be retrained on new equipment?"

What flier is not stirred by such an offer? What fighter pilot does not dream of great heights and speeds? Valeriy Kirillovich's heart beat with happiness. The words "I agree" were ready to burst from his hips.

"Don't be in a hurry", the commander said. "It is necessary to master a helicopter ...." And evidently, having noticed the officer's confusion, added. "Captain Fursov, the interests of the service require this. Think about it thoroughly, and then, we will talk again."

"Become a helicopter pilot.... Why me? I cannot agree!" However, the officer, in chasing these thoughts away, barely recalled the chief's words. "The interests of the service require it." If that's the way they'll have it, it is necessary to go that way.

The helicopter was unusual in many ways. A different design. Other principles for controlling it. Earlier acquired skills did not fit here; moreover, in some flight situations they could even have a negative effect on the neatness of piloting. In a word, it was necessary to break the flying handwriting which had been built up, and at the same time the methods of perceiving what was happening A psychological switching over was required.

And Fursov switched over. He studied the design and aerodynamic features of rotary-wing machines, and when necessary, turned for help to commanders and comrades. He tried to get the maximum possible from every flight. Zeal, diligence and strength of will helped.

Valeriy Kirillovich achieved the assigned goals. The assignments gradually became more complicated;; however, the highest ratings for the most difficult of them remained unchanged.

Officer V. Ordenov, a military pilot firstclass who has known Fursov for a long time, recalled the following episodes.

"An exceptionally serious situation had taken shape during one of the tactical exercises. Because of a blizzard which had arisen, a motorized rifle subunit had dropped behind the main forces and communications with it were broken. It was necessary to restore them immediately. But the clouds hung to the very ground; there was almost no flying visibility. Nevertheless, the command element decided to send a helicopter to look for the motorized riflemen. There was no other way out; many tens of people could get into trouble. They warned Fursov: 'The risk is great and we cannot order you to fly, but ....' Valeriy Kirillovich answered. 'I understand everything. The crew will carry out the assignment.'"

The helicopter men found the motorized riflemen.

Vasiliy Alekseyevich Ordenov continued: "Another time, they got us up in the dead of night. The report was alarming. Obstructions of ice, coming from the upper reaches of the river, had been formed and had literally partitioned the river. It was overflowing, and the water had innundated a large expanse. A serious danger hung over the inhabitants of many population centers. There was just enough time for the preparations."

A spring landscape, night's darkness, and the absence of ground radio navigation systems in the area seriously hampered orientation. Nevertheless, Fursov's crew moved to the designated place and transported a group of people to a safe area. Then, in spite of tiredness, they made several more flights transporting groups of demolition personnel and evacuating the population.

There are quite a few similar cases in officer Fursov's flying biography. He also showed his best side later on as an instructor. Dozens of aerial fighting men are grateful to him for their training.

Fursov's professionalism was improving; however, aviation equipment was also improved. So as not to fall behind it was necessary to study persistently. And so the officer acted. He believed that a solid luggage of skills and knowledge would certainly come in handy. And he was not mistaken.

... Fursov's combat helicopter tore itself away from the ground as if it were weightless. Pulling in the landing gear, the rotary-wing machine climbs to the required altitude in seconds.

From there, the flier throws it into a steep dive. Speed increases swiftly. Near the ground itself, Fursov energetically brings the helicopter into a steep banking turn. After this, another figure -- a chandelle. Again a dive. A climb. The entire series is performed in a single breath.

"I love flying", Lieutenant Colonel Fursov says with satisfaction after landing, and his determined face lights up with a smile.

Based on his colleagues' opinions, there are few who can compare with Fursov in the art of piloting a combat helicopter and in tactical skill. They unanimously confirm that Valeriy Kirillovich is a recognized authority.

Captain Sharchevich narrates: "There is not a single extraneous stroke in Fursov's tactical picture of conducting a battle. The working out of this or that way to attack a target from concept to execution is rigidly regulated and strictly logical, but never a set pattern."

Senior Lieutenant Vasil'yev added:

"One can only dream about the flying handwriting that Valeriy Kirillovich has. When you have been with him in the air, you always feel that you have been enriched with something. More: Lieutenant Colonel Fursov knows how to create a true work attitude on the ground and during a flight."

I guess that officer Fursov's basic secret of instructional success is concealed in this ability.

One of the young fliers was successfully following the retraining program. However, as soon as he began piloting, it was as if the individual had been replaced. Failure followed failure. The officer lost his head and confidence in his own strengthes. Some of the leading elements were inclined to the thought to leave the flier on the helicopter he had already mastered. Without the ability to perform the various figures cleanly, there is no true aerial fighting man.

Fursov held a different opinion. He had noticed that the flier's uncertainty arose because of his poor psychological readiness for piloting. The experienced instructor well knew how to treat such a disease. He reviewed aerodynamic questions with the flier and convinced him, using examples from practice, that there was nothing dangerous in piloting -- the large power-to-weight ratio of the rotary-wing combat machine permitted it to maneuver confidently and energetically through a relatively broad range of speeds and overloads.

The training continued in the air. Fursov demonstrated the figures, required that they be repeated, and corrected mistakes. Then the performance of the series followed. Each flight invariably ended with a business-like and detailed critique. Gradually, no traces of uncertainty in his capabilities remained in the young flier. As a result, he was often mentioned among the best pilots in the squadron.

Fursov remembers with gratitude the communists and Komsomol members who helped him to march more confidently through the stages of ideological and professional growth. He himself actively participates in party work. Valeriy Kirillovich has considered and does consider personal example to be the best way to affect the minds and hearts of his colleagues. There is something to imitate and to learn in him.

Lieutenant Colonel Fursov was the first one in the district's aviation to retrain on the combat helicopter. He was the first to master, look for, and find more effective tactical principles, firing methods, and bombing methods. He was the first to pass the examination for the highest qualification of an aerial fighting man -- expert military officer.

The officer communist's work is noted for its many commendations and awards, including the order, "For Service to the Motherland in the USSR Armed Forces" thirdclass. Lt Col Valeriy Kirillovich Fursov is now working on the staff. However, he can seldom be found in his office. As a rule, he is helping the young fliers storm the heights of combat skill at the airfield.

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AIR FORCES: PSYCHO-PHYSIOLOGICAL QUALITIES OF THE PILOT

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 pp 26-27

/Continuation of an article /No 5, 1980/ by Lt Gen Med Serv N. Rudnyy, doctor of medical sciences: "The Individual in Modern Flight"/

[Text] 2. Readiness

At the dawn of aviation it was considered that any individual, who did not have any substantial physical defects, could be a flier. However, life soon disproved this opinion. At the cost of many unfortunate incidents whose causes were concealed in this or that shortcoming in the pilots, it convincingly proved that far from every physically developed individual -- even one in excellent health -- could successfully operate flying equipment. At the time, the flying practice posed a number of important tasks for the new avenue in science -- aviation medicine. One of them -- the selection of candidates capable of mastering the flying profession -- has remained a pressing one even today.

During the many years of close cooperation between the doctors and commanders of aviation units and subunits, the rules and methods for medically supporting flights and for uninterrupted checking of the flight personnel's health condition in order to improve flight safety and increase the professional longevity of the fliers, have been worked out. Under modern conditions, the problem of ensuring flight safety has not lessened in the least. Moreover, in connection with the complexities of the tasks being solved by aviation, it has imposed new requirements on organizing and improving the flight personnel's training and indoctrination and on further uniting the efforts of aviation specialists, doctors and scientists. Their creative research is now being conducted with a consideration for the latest achievements in the social sciences, aviation equipment, automation, medicine, pedagogics and psychology.

When a school-leaver arrives in an aviation school for fliers, he undergoes today not only a careful medical examination but also a psycho-physiological selection. Attention is paid to the personality qualities and capabilities necessary to master the flying profession successfully. Some forms and methods for training cadets have also undergone changes; their engineer and flying training has been strengthened.

The rapid development of different types of modern airplanes and helicopters requires a truly polytechnical knowledge for their mastery. In this connection, the question of the differentiated selection of candidates for the different arms and branches of aviation has been put on the agenda.

The rapid development of different types of modern airplanes and helicopters requires a truly polytechnical knowledge for their mastery. In this connection, the question of the differentiated selection of candiates for the different arms and branches of aviation has been put on the agenda.

However, health and high psycho-physiological qualities still are not always sufficient to obtain an excellent pilot from a cadet. His confidence in his abilities and deep conviction that the selection of a profession has been made correctly, are needed. Life confirms that a dependable pilot is the one who is truly devoted to aviation, loves it and lives by it and whom the constant desire to fly does not leave.

The necessary qualities are inculcated in an aviator during strenuous training and purposeful indoctrinational work. The formation of an aerial fighting man supposes the development of individual capabilities and the formation of high moral and will qualities and solid professional skills.

As is known, the training of a flier is divided into three basic stages. During the first one, he acquires elementary theoretical knowledge; during the second, he masters flying skills; during the third, he becomes proficient in flying a combat aircraft. The professional training of a flier takes into consideration the fundamental principles of pedagogics. However, the process of making a flier and of forming the necessary qualities and skills is not completed in the school. Their improvement and development continue throughout all flying work. In other words, training is a continuous process for a pilot. Therefore, it is important that the basics of its methodology be identical both in school and in a line unit.

Flying practices testify that solid elementary skills are formed during the body's growth and the physical development and strengthening of the bone and muscle network between the ages of 17 and 25. Experienced instructors take this rebuilding of the body into consideration and continuously observe the conformity of flying loads to the age and physical development of the cadet.

As has already been pointed out, a high strain on an individual's psychological and physiological functions are inherent in flying work. Therefore, it is necessary to form in a pilot a "reserve of strength" and the stability of his body toward various flying factors by using special training sessions and physical exercises. Besides improving endurance, purposeful physical training permits the ability to conduct spatial orientation and to distribute one's attention to be developed, and quick reactions, boldness and decisiveness to be formed. Moreover, regular physical culture classes and daily morning gymnastics compensate for changes in the body which are caused by the strain during a flight and help to save one from tiredness. It is no accident that active rest with mandatory physical exercises is considered an effective measure which takes away nervous and psychological tension.

During the war years, experienced combat fliers did not give up physical training even during the most strenuous days. When the opportunity presented itself, they skied and played volleyball and skittles during the pauses between battles. They played flight against flight, the fliers with the engineers and technicians. What interesting sports battles these were! It was no misfortune that at times there was only one who watched the sights of the volleyball match and the net patched a hundred times.

Now, they forget here and there that without good physical training and continuous sports classes it is difficult to count on victory during modern aerial combat which is usually waged with extreme overloads. I recall one meeting with young fliers. They frankly said that they had not been trained in an aviation school in gymnastic classes and track and field. In the unit, extremely little time is allotted to physical training, and classes are conducted on an incidental basis. Meanwhile, the flight commander reported to the squadron commander that Lt Ye. Sidorov maneuvers with insufficient energy during aerial combat. As a result of this, he is late in opening fire. As it turned out, the flier's stability under strains, which is achieved with the help of physical training and sports, was poorly developed. There were also shortcomings in the physical development of other young fliers. Flying in a modern airplane requires excellent physical preparation and training from an individual. Without this, it is impossible to use the high maneuvering and speed characteristics of a combat machine effectively.

Along with regular piloting flights using special equipment, well organized physical training, during which the necessary breathing rhythm is developed and the cardiovascular system is trained, helps to develop dependable steadfastness toward overloads. A flier's high work tempo in the air requires a certain reserve of attention for comprehending various types of information, making decisions, and carrying it out accurately especially during the dynamics of modern combat or under extreme conditions.

In a complicated meteorological situation without ground reference points being visible, a flier receives information about flight conditions from the flight and navigational instruments. As a result of analyzing the combined information, a picture arises in him of the plane's position in space and its behavior. A mental image -- as they -- of actual reality on whose formation overloads, vibrations, and the sound of the operating engine exert an effect, just as the flier's training and experience do, is created.

Crews receive good pyschological training during night flights. As is known, night presents favorable conditions for a secret maneuver, but at the same time, creates additional nervous and psychological tension which is born from danger. Nevertheless, night flights temper will and psychology and contribute to developing the many other valuable qualities needed to successfully solve a task in a complicated situation.

Unlike stereotyped thinking, an individual's correct reaction during a difficult night flight or under other extreme conditions is the purposeful nature of the reaction and the formation of a plan of action and forms of behavior which would permit the unfavorable effect of outside factors to be eliminated or reduced to a minimum.

For example, Capt V. Volkov was taking part for the first time in the All Union Competition on Flying Sports. Along with him, experienced flying masters fought for the title of winner. Of course, high piloting techniques and good physical training helped Volkov at the time. However, his rivals were prepared no worse. With abilities being equal, the steadfastness of the flier's character, the psychological attitude for victory, the sense of his own merits, and other high moral qualities played the decisive role.

Captain Volkov's teachers and comrades on the team also helped him to become the champion of the country. When the calculation of the points after the completion of the second exercise turned out not to be in his favor, his friends supported the flier and, it was as if they shouldered the burden of responsibility with him. Before the next take-off they said to him. "Fly, Valentin. We believe in you. Return as the champion!" Volkov flew with confidence in his ability. The gold medal was awarded to him for skill and steadfastness, for the fact that he had not passed when faced with the difficulties of a critical flight.

The constantly improving aviation equipment makes its own imprint on the methods and principles for training flying personnel. This is finding timely reflection in the programs, manuals and other documents regulating flight work. As experience shows, one cannot mechanically transfer training principles, adopted in the past, to new types of winged machines, and a flier cannot completely copy his actions on earlier planes.

With the intensification of the training process, technical equipment, especially combined flight trainers which permit the level of a flier's training to be objectively evaluated, are playing an enormous role. The study of a flier's psychophysiological state when practicing different exercises occupies an important place in this. The fact is that any type of professional work, especially in a difficult situation, is linked with the expenditure of physical effort and psychological energy and is accompanied by psychological strain which represents a complicated series of different reactions which assures the ability of an individual to work under these conditions. In general, this is the normal condition of a working individual which creates the optimum vital biological tone. However, the more complicated the work and the less prepared an individual is for it, the more energy he expends on it and the greater is the psychological tension that accompanies his activity. Conversely, the higher the preparation and the firmer the skills, the easier and the freer is the assignment carried out. All this is at the basis of studying a flier's nervous and psychological condition when working on a trainer. It is important that this work be conducted with the active and creative cooperation of the commander and aviation doctor and with the observance of all the requirements for organizing training.

The readiness of a flier for a flight is made up of many components. Knowledge of the equipment and weapons and firm skills in operating them; developed tactical thinking thanks to which an aerial fighting man finds the best way to solve a combat mission; good health and full-value rest; thorough preparation and an attitude to carry out the specific task; and high moral, political and psychological training, are related to these.

These are, so to speak, the most general components, lack of which plays an important role in evaluating the readiness of an aviator. However, there are also purely individual ones which are inherent in only one individual. These can exert considerable effect on the accuracy of solving the task assigned to him with all other conditions being equal. Consequently, the immediate commanders, political workers, and aviation doctors must continuously study the personality features of aviators and purposefully form fighting qualities in them.

Aviation medical laboratory specialists provide a lot of help to commanders. Thus, after a scheduled medical and flight commission, the commander expressed the opinion that Sr Lt V. Kargal'tsev would not be able to master an aircraft which was new to him. The flier had made many errors, and created a precondition for a flying incident, and had been barred from flying.

The decision was made to conduct an experimental psychological examination of the flier. Based on his nature, Kargal'tsev was quiet, even tempered, self-possessed, courteous in his relations with his comrades, and sympathetic. He performed all test assignments successfully, and made decisions skilfully and deliberately. In analyzing the precondition created by him, it turned out that it arose because of a lack of understanding between the flier and the navigator. Kargal'tsev did not conceive of himself without flying work.

The doctors recommended that the commanders give the flier a good work-out on a trainer as part of a crew, allow him on accompanied flights in a combat training airplane, and strengthen their control over his self-preparation for combat employment flights. The command element lent an ear to this advice. At the present time, Senior Lieutenant Kargal'tsev is successfully performing complicated flying assignments in an aircraft which is new to him.

The main thing consists of teaching an individual to regard his actions critically and developing in him a constant demand for self-improvement and the instilling of high moral and political qualities.

The great exploit of our heroic people and of our glorious armed forces and their combat traditions are inspiring the winged fighting men. They are imitating the heroes and learning courage, valor, bravery, and a constant readiness to crush any aggressor from them.

Our advanced ideology impels the aviators to energetic actions and determines the norms of their daily conduct. By studying Marxist-Leninist theory and party and state documents and by participating in socialist competition, Soviet fighting men are becoming convinced of the greatness of communist ideals, thoroughly comprehending the noble goals and tasks of our armed forces, and instilling in themselves the readiness for an exploit.

A communist conviction helps aviators to be steadfast, principled and unbending in the struggle for the just cause of our people to which they are devoting all their efforts. Such a conviction makes the psychological qualities of the motherland's winged defenders more stable and more solid. They firmly know that courage and the readiness for an exploit do not come by themselves. They are born in persistent work.

Col Gen Avn I. Kozhedub, a three-time Hero of the Soviet Union, says: "I have been convinced many times that bravery without training is just the same as a blank round. Enthusiasm alone and desire alone are not enough to become a hero. This can be sufficient for only a short outburst, but not for a long and stubborn battle -- because a battle is work, and skill is important in work."

It is not for nothing that they call conscientious military discipline the first valor of Soviet winged heroes. The ability to get things done, faithfulness to the military oath, observance of requirements, and the exact carrying out of orders open the way to heroic actions.

The outstanding Soviet teacher A. S. Makarenko has written. "It is necessary that an individual act correctly not only when everyone sees him and when they can praise him .... it is necessary to act correctly for oneself, for truth."

Not conceit and a desire to be praised but the ardent desire to follow their duty to the motherland in everything and to protect its aerial frontiers in a fitting manner guide the actions of aviation fighting men.

(Conclusion follows)

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AIR FORCES: NAVIGATION TRAINING AND ORIENTATION

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[Article by Lt Col G. Chaplygin: "The Turning Point Has Disappeared"]

[Text] The complicated aviation equipment and the timely requirements on the training of a military flier-engineer evoke the need for firm skills to be based on a deep knowledge of the special disciplines. One of the basic tasks of helicopter personnel is the ability to arrive at the designated point exactly at the position and on time and land or hover close to the ground there. The high quality solution of the task entirely depends on a flier's navigational training, his experience and ability to use in a combined way radio technical and other navigational systems.

For success during flights close to the ground and also in areas where there are few guidance radio stations, a flier-navigator must perfectly master ways to draw up maps, make navigational calculations, and conduct visual orientation. Such flights require special teamwork and more detailed preparation for the task from crew members. Then, neither low clouds nor limited horizontal visibility will take them by surprise. However, even under seemingly ideal conditions, flights at low altitudes have their own differences and create significant difficulties for flight personnel.

Terrain relief exerts a considerable effect on orientation. It is not enough for a pilot to study the area of the flights; the route; the distinctive bends of rivers or roads; and the location of individual hills, ravines and area reference points along the line of flight. It is also necessary to model it, game in the minutest detail one's actions in the air and during the approach to the landing area or other target, and use a flight map intelligently. Poor skills, errors, and gaps in preparing for a flight invariably give birth to disappointing failures.

Unfortunately, not all future flier engineers understand this. Some rely too much on helicopter radio technical navigational systems supposing that the arrow of the radio compass will help them in any case. Being mistaken in their hopes, they receive low ratings for the performance of exercises, and listen to the severe reprimands of the flight instructors and other teachers in the air and on the ground.

Once, I accidently was a witness to the following conversation of future fliers at an airfield. After a scheduled flight along a route, Cadet M. Nazarov shared his impressions with his comrades.

"We travelled exactly along the line of the assigned route until the middle of the second segment. I determined this from a railroad station and a distinctive reference point -- an elevator. But I could not find the turning point. I thought: Have I really deviated far from it for not more than five minutes. This thought threw me into a fever. But the instructor was observing my actions sympathetically. There and then I recalled his warning. 'A flier must not lose his head during a flight even one in the most complicated of situations.' However, these words had not completely entered my consciousness at that time. Now, they seemingly mobilized me. I thought: 'Where are we flying? Where has our route turning point disappeared to?' There were in general no reference points along the course or to the left or right. Again and again, I looked at the flight map and carefully examined the terrain. I suddenly understood why I was finding nothing. A small ridge with a distinctive hill lay to the front and behind it was a small village with one street --our route turning point."

As we see, everything is important during a flight; it is necessary to take a great deal into consideration. There are no minor details, no primary and secondary things here. Experienced aerial fighting men say correctly that, despite the deplorable on-board and ground radio technical navigation systems, it is necessary to persistently study orienting, using for this every flight -- in the zone, when circling, and along a route. Instructors must persistently promote the development of firm skills in "reading" the ground in the cadets.

I recall the following case. Cadet A. Mikheyev was performing a solo route flight. After passing the first turning point, he was not convinced of the correctness of the new course and trusted in a known reference point. Mikheyev had not turned on the stopwatch as required. Because of this, he made a considerable deviation from the line of the assigned course. Besides the mentioned reasons, what did Mikheyev's error consist of? He was not able to orient himself on the terrain. Three roads moved from the turning point in different directions, one of which the cadet erroneously took for his.

What to say? A visual flight at low altitude while searching for a target is a rather complicated type of flight training. Crews can sometimes make mistakes during it which do not prevent cases of lost orientation even under very favorable meteorological conditions in the simplest of aerial situations. This happens to both people with little experience and to those with superfluous self-assurance.

Cadet Yu. Mishchenko was performing an assignment in an area far from the airfield. With the permission of the flight director, he descended to the altitude for approaching the fourth turn of the circle and took up a course to the point. The prescribed time passed, but Mishchenko did not detect the airfield....

As it later turned out during the critique, the cadet had treated the gaming of the flight model [illegible] area and the return from it in a formal manner. You see, when descending, the visibility of the reference points was also decreased. Mishchenko had not taken this into consideration immediately. In addition, the future pilot completely forgot about the automatic radio compass whose arrow showed the direction to the airfield extremely accurately. During a discussion with Mishchenko it was established that he had a poor knowledge of the distinctive reference points even in the area of the flight circle.

Here is what happened to a better prepared cadet, V. Pisarev. He contrived to lose orientation temporarily even during the first segment of the route. And then, after the flight, even tried to appear before his comrades as almost the hero of the day.

Pisarev justified himself. "The reason was due to the purest of chance. They changed the route the night before. The turning point was moved ten kilometers further than the earlier one. However, in the air I completely forgot that it was necessary to fly longer in time and made the turn where I had the previous day."

Chance. I forgot. Coincidence.... It is disappointing that cadet Pisarev during the critique did not understand the complete seriousness of the error committed by him until the end. You see: if the flight director had not given timely help, it could have led to a failure to perform the assignment.

The reasons for losing orientation,as my instructor colleagues consider, are concealed primarily in the thoughtless attitude of individual cadets to training flights in their obliviousness to the unbreakable laws of flying which say that a helicopter's position under easy meteorological conditions must always be determined in a combined way; with the help of reference points,dead reckoning, and the use of radio technical systems. The absolute majority of cadets act this way and receive only good and excellent ratings. There is no other path to success.

Life confirms that any flight using visual orientation will be completed with high quality only if the crew has a thoroughly thought out and modelled sketch of it. Of course, a detailed gaming of the specific actions during each stage of the assignment from take-off to landing is necessary for this. Regular training sessions on the special equipment permit the required skills to be acquired based on thorough knowledge.

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AIR FORCES: ENGINEERS' WORK ON SERVICING DAY DESCRIBED

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[Article by Engr-Capt S. Nikonov: "An Engineer on A Servicing Day"]

[Text] The deputy aviation regimental commander for the Air Force Engineer Service looked around at those present and having paused briefly reminded them:

"I ask that you prepare thoroughly for the coming servicing day. During recent days the air temperature has been changeable; therefore, any surprise is possible."

Engineers from various specialties and the deputy squadron commanders for the Air Force Engineer Service -- people with various lengths of service and experience -- were located in the planning room. They well understood why the senior chief was concentrating their attention on this measure. Servicing days are planned comparatively rarely, but they plan an important role in the conduct of preventive work on aviation equipment and in the checking of system, assembly and unit reliability.

On a servicing day, the personnel carry out complicated and labor-intensive special purpose inspections and various types of operations on the equipment. The engineers have an opportunity to check on the actions of subordinates, train the troops in various types of inspections, and conduct training sessions with the technicians and mechanics on the use of checking, testing and other equipment. However, an engineer can only play the role of a qualified instructional methodologist if he himself is thoroughly prepared, has available sufficiently complete and operational information on the condition of the aviation equipment he is servicing, remembers all the faults detected, and knows the guidance documents well.

One can conditionally divide an engineer's work in organizing a servicing day into two stages: the preparation portion and direct participation in carrying out what was planned.

During the first stage, the engineer draws up a plan of the technological operations under the direction of the deputy commander for the Air Force Engineer Service. As a rule, it shows the sequence of actions of the specialists in the crews, a list of operations, the theme of the training session, and the time and place for conducting the technical critique.

The more experienced officers -- Engr-Maj V. Dorokhin, Engr-Capts V. Chirkov and V. Ukhov, and others -- do not compete the plan the night before but in advance, during the period between servicing days. This is done with a consideration for fully taking into consideration the latest comments of the flight crews as well as changes in weather conditions for that period.

For example, on one servicing day the engineers gave instructions to check the condition of the control cable run. This operation is not as simple as it would appear at first. You see, a visual inspection and check of the cable do not always give a complete picture of their true condition.

Once in the aviation unit where I was serving at the time, a technician checked everything that was required -- well so it seemed to him -- during the inspection of the cables. He had not detected any break in the filaments, corrosion or jagged strands; and had convinced himself of the reliability of the lubricant. He had accurately measured all the clearances. Nevertheless, the flightschief of the technical maintenance unit -- having checked on his work -- remained dissatisfied with the subordinate's actions. He reproached the specialist for performing the operations without a tensiometer. On checking the reliability of the cable connections for the absence of mechanical damage, he did not use the recommendations given by the engineer, had poorly studied the requirements for inspecting vitally important systems, and did not know all tolerances exactly. Therefore, the technician had to repeat again all of the technological operations.

Remembering this incident, we warned the personnel about the impermissibility of such indulgences in their work and reminded them of several peculiarities in the performance of the operations. The checking of the control cable run was carried out with high quality. And so it was pointed out when the results were summed up.

Our progressive engineers approach the organization of servicing days thoughtfully. The deputy squadron commander for the Air Force Engineer Service tries to use all the existing training equipment and operating electrified stands in the classrooms so that the aviators will completely master the technological sequence.

When necessary during the training sessions, the engineers recommend that demonstration classes be conducted on the aviation equipment. For example, the best technicians in the regiment -- Capt Tech Serv G. Petrov and Sr Lt Tech Serv V. Zlyden -- demonstrated to their colleagues the methods for checking the more important engine units and adjusting clearances within the ranges of allowable norms. This is a form of technical training, a help to the specialist when preparing him for a rating, and an effective means to prevent mistakes.

On the eve of the servicing day, having received instructions from the deputy regimental commander for the Air Force Engineer Service, the engineer assembles the chiefs of the servicing and adjustment operations groups and the chiefs of the technical maintenance unit of the flight, informs them of the list of special purpose inspections and the plan for conducting the operations in their specialty, gives technological instructions for performing the work, and conducts a detailed briefing directly on the aviation equipment. He pays special attention to the punctual observance of safety precautions.

During the servicing day, the engineer observes how fully and consistently the personnel carry out the operations and whether the Air Force Engineer Service specialists are spread rationally among the work sites.

We repeatedly have conducted training sessions with reduced technical crews. This has forced those carrying them out to understand the secrets not only of their own specialty but also those of an allied one. The benefit from this is evident.

The regiment's engineers are not guardians for the technical staff, they do not delve so minutely into those questions which the director of the squadron's Air Force Engineer Service can successfully solve. Basically, they organize and direct the more critical technical operations which require high qualifications and skill. Once, an engineer had to intervene in a checking of the adjustments of the engine and the units tied to it. The specialists, as was required by the technology, had performed the measurements with a guage at the prescribed points. They had not committed any violations. However, the engineer thought that it was necessary to repeat several cycles in the checking. Then during the critique of the servicing day, he dwelt in detail on this case and justified the need for repeated checks with theoretical computations. The engineer's analysis helped the specialists to learn the physical nature of the processes, taking place in the equipment, more thoroughly.

Often during a servicing day, our engineers conduct training sessions with the aviators on special situations during a flight. The class director gives the subordinates various inputs which simulate trouble in the hydraulic or fuel systems, the breakdown of this or that pump, etc. He does not confine himself only to a listing of the points in the instructions. Observing how the aviator works with the cockpit fittings, the engineer asks him to explain each operation performed.

We try to make the critiques of servicing days as instructive as possible. Based on the reports of the chiefs of the servicing groups on the performance of the plan's points and on the condition of the aviation equipment, the engineers determine what errors were made and whether they were typical of the other collectives or only accidental.

In particular, once the engineers found out that some young technicians were not effectively using instrument methods of checking. During a meeting of the instructional methods council, the members of the engineer technical section decided to sum up the experience of the best specialists -- Sr Lts Tech Serv V. Gagulin and S. Rossiyskov and to disseminate their methods for using checking and testing equipment during a servicing day.

The critiques are usually conducted in the training building where there is an opportunity to visually demonstrate to the specialists the troubles found and the ways to eliminate them as well as a chance to perform preventive work.

As the guidance documents require, we organize servicing days before the day for preliminary preparations. Other work, which is not connected with the servicing day, is not performed during this period. The servicing day is used to involve all personnel and is one of the effective ways to ensure the high reliability of aviation equipment on the ground and in the air.

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AIR FORCES: MILITARY-TECHNICAL CONFERENCE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 p 34

[Article by Engr-Lt Col A. Lavrinov: "And Again in the Shadows"]

[Text] Engr-Maj V. Fedyunin organizes military technical conferences instructively. Let us take one of the latest ones. The distinctive features in the servicing and combat employment of fighter-bombers under various climatic conditions were discussed during it. The regimental commander, political workers and engineers from the services had participated in planning its conduct. The subjects of the reports and co-reports had been determined during a special meeting of the instructional methods council. By the opening day of the conference, the activists headed by Engr-Maj O. Neshta had set up an exhibition of the works of rationalizers and inventors; a stand with a description of the troubles and breakdowns, which arise due to the fault of personnel, and of cases of poor preparation of equipment for flights; as well as other visual aids. Their goal was to bring to each aviator the errors and miscalculations committed by personnel who service aviation equipment. Unfortunately, they have still not been eliminated. Here is an example.

While flying an aircraft after the engine had been replaced, a flier moved the engine control throttle the maximum number of turns to idle. Suddenly, the power plant shut off. When analyzing the cause of what happened, it turned out that WO [Praporshchik] O. Zadorozhnyy, the servicing group's mechanic, had partially over-squeezed the hose of the air system which provided for the supply of compressed air to the valve setting the engine revolutions.

Sr Lt Tech Serv V. Mirskov checked Zadorozhnyy's work with too little attention, and Capt Tech Serv A. Zorin analyzed the data from the on-board objective control equipment for the first flight superficially. The two experienced specialists had not noticed the trouble because they treated the performance of the requirements in the documents, which regulate the servicing of modern equipment, in a formal manner.

What was done to prevent a similar case? First of all, all Air Force Engineer Service personnel were informed of this incident. The engineers conducted classes during which the attention of the subordinates was once again directed to the more important propositions in the servicing instructions. In order to strengthen knowledge, the group chiefs, the chiefs of the technical maintenance units of the flights, and the deputy squadron commanders for the Air Force Engineer Service organized topical training sessions with the technicians and mechanics. Then, the aviators took examinations.

There are cards in the unit for training the engineer and technical staff. Various inputs, considering the specialists' level of training and rated qualifications, are included on them. The youth under the observation of experienced instructional methodologists improve their skills in equipping airplanes with ammunition and the ways of closing the throats of fuel and oil tanks.

During training sessions, the leaders pay attention not only to the results of the operations and compliance with time norms but also to the observance of the technological sequence and safety measures, and also watch how progressive principles and methods are being used.

It seems, a great deal is being done to prevent derelictions in the work of the technical staff. However, because of a number of reasons they still let themselves be known once in a while. Thus, once the lock on the door of the braking parachute container opened spontaneously after a plane took off. It turned out that the aircraft technician, Sr Lt Tech Serv A. Eis had violated the sequence for closing the lock. The incident of the spontaneous release of the braking parachute was discussed directly at the aircraft, special attention was paid to Sr Lt Tech Serv A. Eis's mistake, and a method for installing the parachute was developed. Undoubtedly, all the measures were useful, but again purely operational. When there is a poorly developed sense of responsibility, a specialist's insufficient ability to get things done, and carelessness, this is too little.

And indeed, Lt Tech Serv V. Leont'yev, an aircraft technician, made a mistake. After filling the oil reservoir he did not notice that the cable had fallen under the filler cap. Oil was kicked out. During the critique of the precondition, the technician reported that he knew about the possibility of faulty sealing when the techniques for closing the throat were violated. The carelessness led to failure in the performance of the assigned task.

When analyzing the precondition, the engineers concluded that the fault here was not the lack of training of the specialists. Their qualifications were high -- but the presence of an underfulfillment of indoctrination questions. Indeed, after clear violations of the rules for working on the equipment, it is necessary to question the exactingness of Air Force Engineer Service leaders and the ability of their subordinates to get things done.

It was emphasized during the conference that it was necessary to create in each group and subunit an intolerant attitude toward any appearance of a careless attitude toward the rules for servicing and maintaining aviation equipment. The regiment's engineers, the deputy squadron commanders for the Air Force Engineer Service, and the chiefs of the technical maintenance units in the flights and servicing group must pay more attention to the indoctrination of subordinates.

The speakers talked about the fact that forming in personnel the qualities necessary for the irreproachable servicing of aviation equipment and instilling a sense of responsibility for the job entrusted depend a lot on the continuous exactingness of Air Force Engineer Service leaders. They held up as examples skilfully indoctrinated subordinates. For example, Sr Lt Tech Serv N. Zarakovskiy, chief of the technical maintenance unit of a flight, personally helps the young and less trained technicians to master their specialty. In doing this, a practice demonstration is used along with discussions and narrations. Concerning control, here there exists no division of the technicians into experienced and inexperienced. All are subject to a strict checking. The chief of the flight's technical maintenance unit periodically assigns technicians the task of telling the personnel about the peculiarities in servicing one of the plane's systems.

The deputy squadron commander for the Air Force Engineer Service, Maj Tech Serv Kh. Khaliulin, considers technical critiques to be a good school for indoctrination. He prepares for them carefully and submits the most instructive facts for the discussion. The positive experience of individual specialists or whole groups is studied during the critique. Once, an aircraft technician, Sr Lt Tech Serv A. Mukhin, detected a breakdown in a plane which had arisen because an oversight by the specialists. It was far from simple to do this. Mukhin shared his work experience with his colleagues. The unit commander commended the conscientious officer.

They carefully prepared for the conference in the squadron's flights and the technical maintenance unit of the regiment. The presentations of the excellent aviation personnel, the visual agitation, and the demonstration classes permitted the experience acquired in servicing and in the combat employment of an airplane to be summed up. They helped to improve the skill of the flight and technical staffs and instill confidence in the reliability of the equipment. The conference participants emphasized the need to study progressive experience more deeply and to publicize and incorporate it on a broad basis at the sites. They also pointed out that not all engineers are engaged in questions concerning the indoctrination of Air Force Engineer Service personnel. Some of them are not sufficiently demanding on subordinates. They recommended that they pay attention to instilling in specialists not only high technical standards but also the ability to get things done and responsibility for the quality with which aviation equipment is prepared for flights.

Such creative discussions help Air Force Engineer Service personnel to solve the tasks, which are aimed at ensuring flying safety, more successfully.

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AIR FORCES: AIRCRAFT TECHNICIAN TRAINING

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 6, 1980 pp 40-41

[Article by Sr Lt Tech Serv M. Grigor'yev, military technician firstclass: "The Air Pressure Has Fallen"]

[Text] The ability of specialists, who prepare airplanes and helicopters for flights, to work accurately and in a coordinated manner and to do everything required in strict sequence, as the guidance documents direct, has always been valued very highly. Today, the role of these important qualities has grown. Aviation equipment is now more complicated and -- if such an expression is permissible -- the retribution costs for mistakes, lack of teamwork and carelessness are becoming greater. Nevertheless, cases of a negligent attitude towards official duties are encountered. I would like to talk about one of them.

Lt Tech Serv L. Vinnik is a young specialist. He has sufficient theoretical training, and the skills in servicing planes, which he acquired in school, are not bad. These and the help of his chiefs and more experienced comrades permitted the officer to become effective and receive the right to work on his own rather quickly. At first, everything went well for him. Suddenly -- a serious misfire.

Having arrived at the airfield at the designated time, Vinnik without delay began the preflight preparation of the winged machine. He towed it to the assigned place in the centralized fueling station. There, he carefully inspected the plane. Nothing evoked the technician's alarm. The external appearance, the fueling and charging of the systems, the condition of the cockpit equipment -- everything corresponded to the norm. Vinnik made the necessary notes in the log on preparing a fighter for flying and reported to the chief of the flight's technical maintenance unit. After checking, the latter gave permission for the machine to be released for the assignment, and the technician began to wait for the fliers with a calm heart.

When he had saluted, the lieutenant reported confidently to the crew commander: "Comrade Captain, the plane is ready for the flight."

Again an inspection and the appropriate notes in the documents. The pilot took his place in the cockpit. The technician helped him to buckle the seat belts and start the engine. After this, having removed the blocks from under the wheels, he gave permission for it to taxi.

The fighter smoothly moved off its position. Before the actual take-off line, it was faced with one more check -- at the technical control post. There, the specialists also did not detect any troubles.

Here is the runway. Permission to take-off is received. The metallic notes of the increasing revolutions of the turbine are ever higher. There and then, the flier's anxious words were carried in the ether.

"Air pressure in the main pneumatic system has fallen."

At the same time, the roar of the jet was sharply cut short.

The flight director transmitted: "I forbid take-off, shut off the engine."

A minute later, a tractor from the technical assistance team arrived at the missile carrier. Without delay, the fighting men removed the fighter from the runway on which an aircraft which had returned from an assignment landed. No delays arose and the work continued as the planning table for the shift provided.

The flier soon departed on the flight, having taken a seat in the cockpit of a reserve airplane.

Meanwhile, at the centralized fueling station, they immediately began to find the causes for the aborted take-off. The arrow of the air system's pressure gauge stood at a figure considerably less than the one which corresponds to a normal charging. The squadron's Air Force Engineer Service specialists asked the question. Where did such a large quantity of gas go during such a short taxiing?

They did not find any damage in the lines or assemblies. Everything took, as they say, its place when they checked the wheel brake discs. Their wear was rather considerable, and it was risky to taxi about the airfield with it this way.

Was it possible to know beforehand such a dangerous -- especially with intensive flying -- defect. Of course. Lieutenant Technical Service Vinnik had only to check the sinking of the signalling device and the expenditure of air when pressing the braking lever, and he would have immediately sensed that something was wrong. However, the young officer had not done this.

The airplane technician said in his justification: "I checked the working order of the brakes and the disc wear on the day of the last preliminary preparation."

At the time, everything corresponded to the norm. This reassured the young specialist and gave birth to complacency in him. Therefore, when preparing his fighter for the next flights, the technician did not pay the necessary attention to checking the condition of the braking system; he thought: what changes could take place in it in such a short period of time?

No matter how they approached the evaluation of what had happened, only one conclusion suggested itself. The young technician had displayed unforgivable professional carelessness. You see, he well knew that two flying days, which followed one after the other, had preceded the day of the last preliminary preparation. During them, beginning aerial fighting men had flown in a circle in Lieutenant Technical Service Vinnik's fighter. It is completely understandable, that a great strain was placed on the landing gear, including the braking system. Undoubtedly, this should have pricked up the ears of the winged machine's proprietor-- that is to say, sharpened his vigilance with regard to checking the airplane's landing gear.

Not only Vinnik deserves a rebuke. A share of the responsibility for what happened lies on the chief of the flight's technical maintenance unit. He had not reminded his subordinate of the need to check the braking system and decreased his checking of the technician's work. Evidently, the recent confident actions of the young officer had dampened his ardor.

It was well that the pilot, in bringing the revolutions to the maximum, had paid attention to the main air system's pressure gauge. It is easy to imagine what would have happened if he had not done this. Landing with a small residue of air could have led to a rather undesirable consequence.

Fortunately, everything ended well. The reserve plane permitted the planning table for the flights not to be recarved. The Air Force Engineer Service specialists quickly put Vinnik's fighter back in operation. However, the technicians professional carelessness brought definite moral losses to the squadron's fighting men that day; engaged in working on the disabled airplane, the people were diverted for some time from performing other jobs no less important for the safety of the flights and their high quality.

This case was thoroughly discussed with the squadron's flight and engineer-technical staff. In doing this, it was emphasized that one must display high vigilance, accuracy, and a creative approach to the task in everything touching on the servicing of aviation equipment. The aborted take-off also became a good lesson for Vinnik himself. The young officer now works more purposefully and with more initiative.

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AIR FORCES: FACTUAL ACCIDENT REPORTS NECESSARY

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[Article by Maj B. Makarevich: "In an Incorrect Light"]

[Text] I learned about the story, which I plan to relate, while on TDY. Some Air Force Engineer Service officers who took part in analyzing the precondition for a flight incident, are no longer in the training aviation regiment. However, they still remember this event here. A meeting with Maj Yu. Kharkhavkin has convinced me to take up a pen since there is quite a bit that is instructive in this story.

The senior comrades have characterized officer Kharkhavkin as a master of piloting and a skilful indoctrinator of the cadets. A special bulletin was devoted to his resourcefulness and intelligent and cool actions during a special flight situation. However, when I -- wishing to learn more details about this flight -- asked about it, the officer's face changed, as if a shadow lay there.

Bitterness was heard in Major Kharkhavkin's word. "Frankly speaking, I do not want to remember."

How so? The man had been commended, and he seemingly was dissatisfied. It turns out that this had been done quite late. Immediately after the flight, Kharkhavkin had been suspected of dishonesty. Here is how events developed.

Soon after take-off, the officer suddenly heard a strong clap, then a whistle. A tight stream of air burst into the cockpit. Having evaluated the situation in an instant, the flier instructor immediately reported to the ground.

"The canopy has opened."

"Break off the assignment," the flight director immediately transmitted, "Climb, decrease speed, expend fuel in a circle."

Kharkhavkin immediately carried out the instructions. The thought burned his consciousness. "If the canopy opens even more, it can be ripped off. The fact that the fighter will receive damage cannot be excluded. Yes, and landing with an open canopy -- this is a difficult task." It was necessary to look for a way out.

Acting decisively and with initiative, officer Kharkhavkin closed the canopy. Then, he landed his winged machine excellently.

After the landing, they began to look for the reason for the precondition which had arisen for a flight incident. The flier also pondered over it. Estimating this way and that, he concluded that the canopy opened in flight due to an error by the technician. He shared his observations with the engineers.

It seemed that the key to revealing the truth had fallen into their hands. However instead of using it, the officers were doubtful. "Is not the flier himself guilty? Was it possible to close the canopy by acting as Kharkhavkin said?" They conducted an experiment and were convinced. Yes, it was possible. Nevertheless, doubts about the accuracy of the engineers' report remained after this and some of them concluded right out: The pilot is guilty. Rumors continued for several days. However, Kharkhavkin stood firm, did not give in, and as a result was able to show the precondition was the result of a mistake by the technician.

Would that the engineers themselves would come to a similar conclusion also. Only the prejudiced attitude toward the flier's information and a false concern for the honor of the uniform: As they say, there is complete order in our service, prevented this.

This story ended with the following. A modified sequence for an airplane technician's actions when closing the canopy was worked out and approved. This, of course, improved flight safety.

The pilot himself prefers to forget this incident and cast it from his memory. Distrust is a poor companion in work. I would like to point out that the unprincipledness of individual comrades led to the fact that an example of resourcefulness and skill on the part of a flier instructor was not used for a long time for the sake of the cadets indoctrination and moral and psychological preparation for actions in a difficult flight situation.

Honesty and straightforwardness have been appreciated since olden times. Their role in aviation is especially great. Attempts to conceal the truth, no matter by what they are motivated, will always cause great damage to the training and indoctrination task. The striving of some servicemen to twist reality -- to so say, to present black as white, is displayed for many reasons. The main ones are, it seems, a dulling of the sense of personal responsibility and a lack of discipline. This is becoming possible because of the poor exactingness of commanders and chiefs.

Such a situation is especially intolerable in military schools. Today's cadet will be tomorrow's officer and will next head a subunit. Those, who train and indoctrinate future fliers, engineers and technicians, understand this. However, once in a while cases are still encountered where individual officer leaders bargain with their consciences.

Cadet Yu. Yudin was performing a solo flight. Soon after the take-off he detected trouble in the operation of some instruments. The beginner pilot did not lose his head. He left for the airfield on his own. However, even after this the situation did not clear itself; the landing gear had to be lowered using the emergency method.

Yudin broke the left strut from the lock and then the right and forward ones. However, the right strut did not come out. The flight director confirmed this when the fighter-bomber passed over the take-off point.

Officer V. Yegorov, an experienced flier instructional methodologist was sent into the air. Having drawn near to Yudin's airplane, he indicated with a gesture. Pull, as they say, the line harder. The cadet understood and answered also with a gesture. Nothing is happening.

The landing of a fighter-bomber on one wheel is extremely complicated even for an experienced aerial fighting man. It is easy to understand what a test it was for Yudin. The cadet passed it.

Right after the landing, the cadet told in detail about his actions in the air. The precondition had arisen due to Yudin's fault. He had not turned on the generator and had not paid attention to the signalling instrument. He also did not notice that the battery had become inoperative because of the excessive load. That is why many instruments and the radio equipment did not work. Yudin made one other mistake. Without convincing himself that the lamps for the retracted position of all landing gear struts were out, he put the emergency system for lowering the gear into operation. As a result, the right strut froze to the lock. However, subsequently during the landing -- the cadet worked intelligently, prudently and coolly.

Yudin was ordered to put down on paper everything that had occurred during the flight. When they read what had been written, they were surprised that a number of items in the document were given in an incorrect light. The cadet had acted this way on the recommendation of the instructor and flight commander. Having forgotten about their responsibilities as indoctrinators, they had advised him to write as if the precondition had arisen because of a breakdown in the equipment.

Military ethics, honesty and truthfulness are indispensable items in the indoctrination of a future aerial fighting man. The frank narration of what transpired in the air serves as a guarantee that the mistake will not be repeated.

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